

**SAMSUNG TECHWIN**

# **NETWORK CAMERA**

User Manual

SNF-8010/SNF-8010VM



# Network Camera

## User Manual

---

### Copyright

©2014 Samsung Techwin Co., Ltd. All rights reserved.

### Trademark

 **SAMSUNG TECHWIN** is the registered logo of Samsung Techwin Co., Ltd.

The name of this product is the registered trademark of Samsung Techwin Co., Ltd.

Other trademarks mentioned in this manual are the registered trademark of their respective company.

### Restriction

Samsung Techwin Co., Ltd shall reserve the copyright of this document. Under no circumstances, this document shall be reproduced, distributed or changed, partially or wholly, without formal authorization of Samsung Techwin.

### Disclaimer

Samsung Techwin makes the best to verify the integrity and correctness of the contents in this document, but no formal guarantee shall be provided. Use of this document and the subsequent results shall be entirely on the user's own responsibility. Samsung Techwin reserves the right to change the contents of this document without prior notice.

- ❖ Design and specifications are subject to change without prior notice.
- ❖ The initial administrator ID is "admin" and the password should be set when logging in for the first time. Please change your password every three months to safely protect personal information and to prevent the damage of the information theft.  
Please, take note that it's a user's responsibility for the security and any other problems caused by mismanaging a password.

## IMPORTANT SAFETY INSTRUCTIONS

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings, Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/ accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lighting storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.



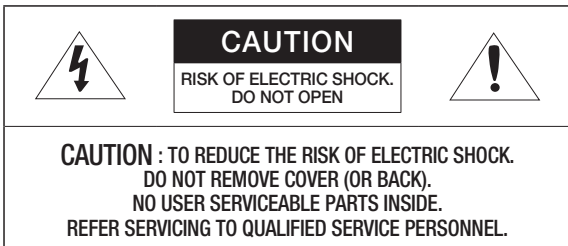
## WARNING

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE. DO NOT INSERT ANY METALLIC OBJECT THROUGH THE VENTILATION GRILLS OR OTHER OPENINGS ON THE EQUIPMENT.

Apparatus shall not be exposed to dripping or splashing and that no objects filled with liquids, such as vases, shall be placed on the apparatus.

To prevent injury, this apparatus must be securely attached to the Wall/ceiling in accordance with the installation instructions.

## CAUTION



## EXPLANATION OF GRAPHICAL SYMBOLS



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.



## Class I construction

An apparatus with CLASS I construction shall be connected to a MAINS socket outlet with a protective earthing connection.

## Battery

Batteries(battery pack or batteries installed) shall not be exposed to excessive heat such as sunshine, fire or the like.

## Disconnection Device

Disconnect the main plug from the apparatus, if it's defected. And please call a repair man in your location.

**When used outside of the U.S., it may be used HAR code with fittings of an approved agency is employed.**

## CAUTION

Risk of explosion if battery is replaced by an incorrect type.  
Dispose of used batteries according to the instructions.

These servicing instructions are for use by qualified service personnel only.  
To reduce the risk of electric shock do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

Please use the input power with just one camera and other devices must not be connected.

**The ITE is to be connected only to PoE networks without routing to the outside plant.**

# overview

---

Please read the following recommended safety precautions carefully.

- Do not place this apparatus on an uneven surface.
- Do not install on a surface where it is exposed to direct sunlight, near heating equipment or heavy cold area.
- Do not place this apparatus near conductive material.
- Do not attempt to service this apparatus yourself.
- Do not place a glass of water on the product.
- Do not install near any magnetic sources.
- Do not block any ventilation openings.
- Do not place heavy items on the product.

User's Manual is a guidance book for how to use the products.

The meaning of the symbols are shown below.

- Reference : In case of providing information for helping of product's usages
- Notice : If there's any possibility to occur any damages for the goods and human caused by not following the instruction
- ✕ Please read this manual for the safety before using of goods and keep it in the safe place.

# CONTENTS

---

## OVERVIEW

3

- 3 Important Safety Instructions
- 9 Product Features
- 10 Recommended PC Specifications
- 10 Recommended Micro SD/SDHC/SDXC Memory Card Specifications
- 11 NAS recommended specs
- 11 What's Included
- 13 At a Glance

## INSTALLATION & CONNECTION

16

- 16 Installation
- 19 Inserting/Removing a Micro SD Memory Card
- 20 Memory Card Information (Not Included)
- 21 Connecting with other Device

## NETWORK CONNECTION AND SETUP

28

- 28 Connecting the Camera Directly to Local Area Networking
- 29 Connecting the Camera Directly to a DHCP Based DSL/Cable Modem
- 30 Connecting the Camera Directly to a PPPoE Modem
- 31 Connecting the Camera to a Broadband Router with the PPPoE/Cable Modem
- 32 Buttons used in IP Installer
- 33 Static IP Setup
- 37 Dynamic IP Setup
- 38 Port Range Forward (Port Mapping) Setup
- 40 Connecting to the Camera from a Shared Local PC
- 40 Connecting to the Camera from a Remote PC via the Internet

## WEB VIEWER

41

- 41 Connecting to the Camera
- 43 Password setting
- 43 Login
- 44 Installing STW WebViewer Plugin
- 46 Using the Live Screen
- 50 Playing the recorded video

## SETUP SCREEN

57

- 57 Setup
- 57 Basic Setup
- 70 Video & Audio setup
- 79 Network Setup
- 88 Event Setup
- 93 NAS (Network Attached Storage) guide
- 107 System Setup
- 112 Viewing profile information

## APPENDIX

113

- 113 Specification
- 120 Product Overview
- 122 Troubleshooting
- 124 Open source license notification on the product

## PRODUCT FEATURES

- **Fisheye lens**

This lens has 360° vision and it can record video panoramically.

If you use Smart Viewer on your PC, you can view corrected video in real time.

- **Dustproof/Waterproof (IP66) (SNF-8010VM)**

The dustproof and waterproof design makes you feel at ease when installing the product outdoors or exposing it to rain.

- **HD Video Quality**

- **Multi-Streaming**

This network camera can display videos in different resolutions and qualities simultaneously using different CODECs.

- **Web Browser-based Monitoring**

Using the Internet web browser to display the image in a local network environment.

- **Alarm**

When an event occurs, the captured video of the event is sent to the e-mail and FTP server registered by the user or is saved in the Micro SD memory card or NAS.

- **Tampering Detection**

If the monitoring is interrupted in any way, the camera will trigger the event alarm.

- **Video Motion Detection**

Detects a motion from the video before triggering an event.

- **Audio Detection**

Detects sound louder than a certain level specified by user.

- **Auto Detection of Disconnected Network**

Detects network disconnection before triggering an event.

- **ONVIF Compliance**

This product supports ONVIF Profile-S.

For more information, refer to [www.onvif.org](http://www.onvif.org).




Driving network video through global standardization



- This piece of equipment is a high resolution video transmission tool that supports a resolution of 2 mega pixels or higher. When you transmit high resolution video with a resolution higher than what is supported by the RFC2435 (RTP payload format for JPEG), the existing low resolution spec, it uses the Onvif JPEG extension header method for transmission of high resolution video. Thus, when you transmit high resolution video to external equipment or S/W using Onvif, you need to check whether your client equipment or S/W supports the most up-to-date spec, Onvif JPEG extension header method.

## RECOMMENDED PC SPECIFICATIONS

---

- CPU : Chips sporting Intel Core i5 or higher
  - Web Plug-in is optimized to SSE 4.1 Instruction Set.
- Resolution : 2048X1536 pixels or higher (32 bit color)
- RAM : 2GB or higher
- Supported OS : Windows XP / VISTA / 7 / 8, MAC OS X 10.7
- Supported Browser : Microsoft Internet Explorer (Ver. 8~11)  
Mozilla Firefox (Ver. 9~19), Google Chrome (Ver. 15~25),  
Apple Safari (Ver. 6.0.2(Mac OS X 10.8, 10.7 only), 5.1.7) ※ Mac OS X only
  - Windows 8 is supported only in the Desktop mode.
  - Neither a beta test version unlike the version released in the company website nor the developer version will be supported.
  - For IPv6 connection, Window 7 or higher is recommended.
  - For Mac OS X, only the Safari browser is supported.
- Video Memory : 256MB or higher
  -  ■ If the driver of the video graphic adapter is not installed properly or is not the latest version, the video may not be played properly.
  - For a multi-monitoring system involving at least 2 monitors, the playback performance can be deteriorated depending on the system.

## RECOMMENDED MICRO SD/SDHC/SDXC MEMORY CARD SPECIFICATIONS

---

- 4GB ~ 64GB
- For your camera, we recommend you use a memory card from the following manufacturers:  
Micro SD/SDHC/SDXC Memory Card : Sandisk, Transcend
- It is recommended a memory card of specification Class 6 or higher is used.

## NAS RECOMMENDED SPECS

- Recommended capacity : 200GB or higher is recommended.
- Simultaneous access : One unit of NAS can accept a maximum of sixteen camera accesses.
- For this camera, you are recommended to use a NAS with the following manufacturer's specs.





Recommended products	Available sizes
Netgear NAS	A maximum of 16 cameras can access simultaneously.
Synology NAS	A maximum of 16 cameras can access simultaneously.











- When you use Netgear's NAS equipment, do not allocate the capacity for use.
- If you use NAS equipment for purposes other than video saving, the number of accessible cameras may be reduced.

## WHAT'S INCLUDED

Please check if your camera and accessories are all included in the product package.

Appearance	Item Name	Quantity	Description	Model Name
	Camera	1		SNF-8010 or SNF-8010VM
		1		
	Instruction book, Installer S/W CD	1		SNF-8010/ SNF-8010VM
	Quick Guide (Optional)	1		SNF-8010/ SNF-8010VM

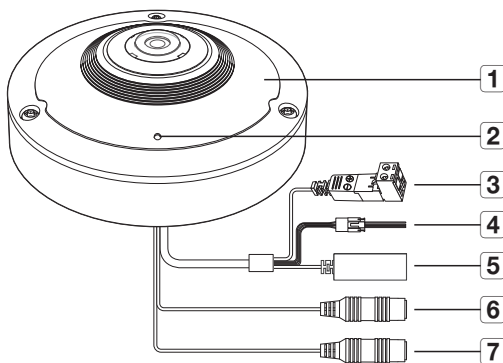
# overview

Appearance	Item Name	Quantity	Description	Model Name
	Warranty card (Optional)	1		SNF-8010/ SNF-8010VM
	L Wrench	1	To remove/fix the cover top	SNF-8010/ SNF-8010VM
	Drill bit	1	Used to disassemble or assemble the top cover, or install the camera.	SNF-8010/ SNF-8010VM
	Template	1	Product installation guide	SNF-8010/ SNF-8010VM
	Tapping Screw	3	Used for installation on the wall or ceiling	SNF-8010/ SNF-8010VM
	Plastic Anchor	3	For fixing a screw, Inserted in a hole (reinforced anchoring force)	SNF-8010/ SNF-8010VM
	Machine Screws	3	Used for assembling the dome case when installing the product on the pipe, wall mount, etc. or blocking a hole.	SNF-8010/ SNF-8010VM
	M12-RJ45 conversion cable	1	Using it to connect the M12 connector of your camera to general network equipment	SNF-8010VM

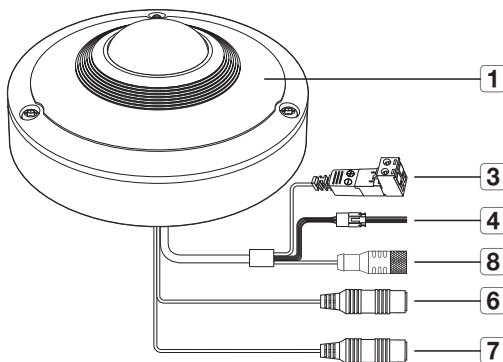


## AT A GLANCE

### Appearance



<SNF-8010>

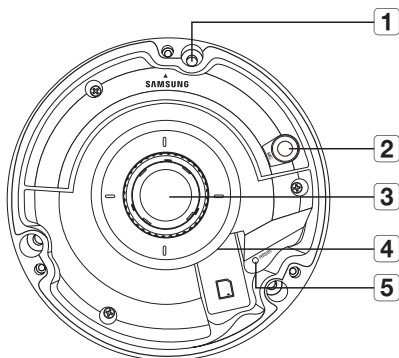


<SNF-8010VM>

# overview

Item		Description
<b>1</b> Cover top	SNF-8010	Case cover used to protect the main unit.
	SNF-8010VM	Case cover used to protect the lens and the main unit.
<b>2</b> Microphone hole	A microphone is embedded. ■ It is applicable only to the SNF-8010 model.	
<b>3</b> Power Port	Used to plug the power cable.	
<b>4</b> Alarm I/O Port	ALARM IN	Used to connect the alarm input sensor.
	ALARM OUT	Used to connect the alarm output signal.
	GND	Common port for alarm output signal.
<b>5</b> Network Port	Used to connect the PoE or Ethernet cable for network connection.	
<b>6</b> Audio Out Jack	Used to connect to speakers. (green)	
<b>7</b> Audio In Jack	Used to connect to a microphone. (pink)	
<b>8</b> M12 Female connector cable	Connect to the M12 Male connector cable for power supply and network connections.	

## Inside



Item	Description
<b>1</b> Camera fixing hole	Hole used for securing the camera onto a ceiling.
<b>2</b> MIC	<p>The MIC is built into the camera.</p> <ul style="list-style-type: none"> <li>It is applicable only to the SNF-8010 model.</li> </ul>
<b>3</b> Fisheye lens	This lens has 360° vision and it can record video panoramically.
<b>4</b> Micro SD Memory Card Compartment	Compartment for the Micro SD memory card.
<b>5</b> Reset Button	<p>The button restores all camera settings to the factory default. Press and hold for about 5 seconds to reboot the system.</p> <p><b>!</b> If you reset the camera, the network settings will be adjusted so that DHCP can be enabled. If there is no DHCP server in the network, you must run the IP Installer program to change the basic network settings such as IP address, Subnet mask, Gateway, etc., before you can connect to the network.</p>

# installation & connection

---

## INSTALLATION

---



- This camera(SNF-8010VM) is waterproof and in compliance with the IP66 spec, but the jack connected to the external cable is not. You are recommended to install this product below the edge of eaves to prevent the cable from being externally exposed.

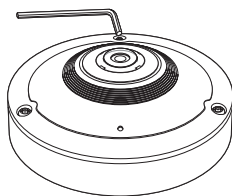
### Precautions before installation

Ensure you read out the following instructions before installing the camera:

- Select an installation site that can hold at least 5 times the camera's weight.
- Stuck-in or peeled-off cables can cause damage to the product or a fire.
- For safety purposes, keep anyone else away from the installation site.  
And put aside personal belongings from the site, just in case.

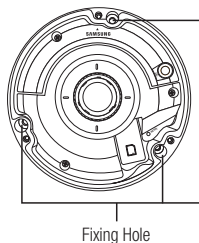
### Disassembling

1. Using the L-shaped wrench or drill bit provided with the product, unwind the three nuts in a clockwise direction to remove the top cover.
  - Note that it is not necessary to loosen the screws completely.

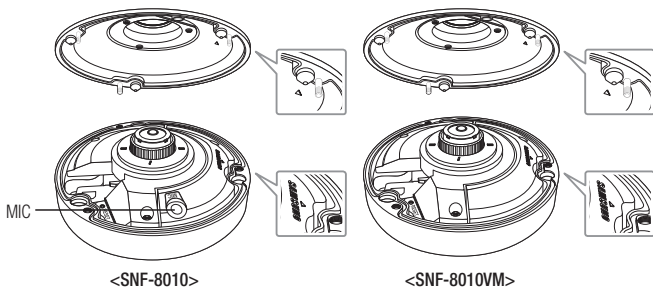


## Installing the camera on the ceiling or a wall

1. Select a location where you want to install the camera.
2. Insert the provided screw into the camera hole and turn it clockwise.



3. Using the L shaped wrench or drill bit, fasten the top cover in place in a clockwise direction.



- To fix the cover, you should match the triangular arrows to assemble correctly.
- If the cover is not fixed tightly, you may encounter a problem with waterproofing. (IP66) (SNF-8010VM)

# installation & connection

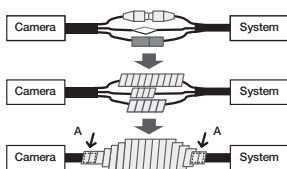
## Outdoor installation (SNF-8010VM)

When you install the camera outdoors, it should be waterproofed with waterproof butyl rubber tape (which can be purchased in stores) so that water does not leak from the gap of the cable connected in the outdoor area.

1. Connect the power, audio I/O and LAN cables.
2. Wrap the black cable jacket (Area A) and the cable connection area with waterproof (butyl rubber) tape so that more than half of the butyl rubber tape is overlapped.



- If the cable jacket is not waterproofed properly, then it can directly cause leakage. Make sure to protect the cable with a dense layer of taping.
- Waterproof butyl tape is made of butyl rubber that can be stretched to twice its normal length.



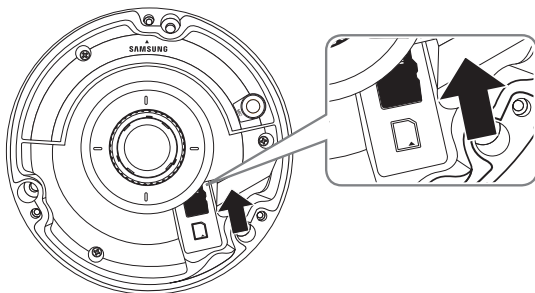
## INSERTING/REMOVING A MICRO SD MEMORY CARD



- Disconnect the power cable from the camera before inserting the Micro SD memory card.
- Do not insert the Micro SD memory card while it's upside down by force. Otherwise, it may damage the Micro SD memory card.

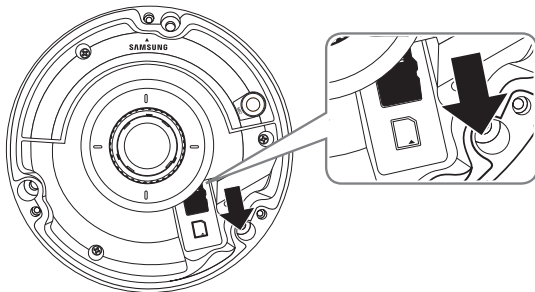
### Inserting a Micro SD Memory Card

Push the Micro SD memory card in the direction of the arrow shown in the diagram.



### Removing a Micro SD Memory Card

Gently press down on the exposed end of the memory card as shown in the diagram to eject the memory card from the slot.



# installation & connection

---



- Pressing too hard on the Micro SD memory card can cause the card to shoot out uncontrollably from the slot when released.
- Before removing your Micro SD memory card, turn off the camera or go to **<Storage>**, turn the device off, and press the **[Apply (  button. (Page 89)**
- If you turn off the camera or remove the Micro SD memory card that contains data from the product, the data may be lost or damaged.

## MEMORY CARD INFORMATION (NOT INCLUDED)

---

### What is a memory card?

The memory card is an external data storage device that has been developed to offer an entirely new way to record and share video, audio, and text data using digital devices.

### Selecting a memory card that's suitable for you

Your camera supports Micro SD/SDHC/SDXC memory cards.

You may, however, experience compatibility issues depending on the model and make of the memory card.

For your camera, we recommend you use a memory card from the following manufacturers:

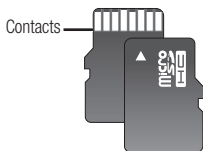
Micro SD/SDHC/SDXC Memory Card : Sandisk, Transcend

Memory cards of 4GB ~ 64GB is recommended for using with this camera.

Playback performance can be affected depending on the speed of memory card, so use the high-speed memory card.

It is recommended a memory card of specification Class 6 or higher is used.

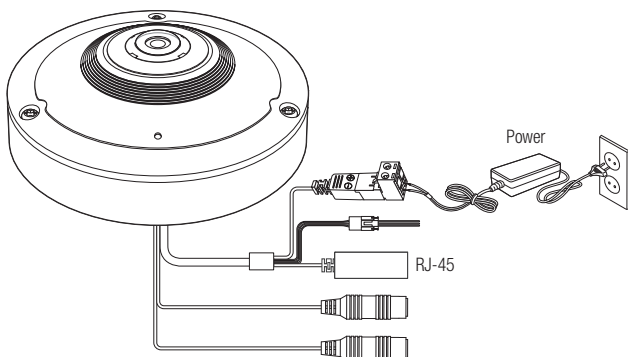
### Memory Card Components



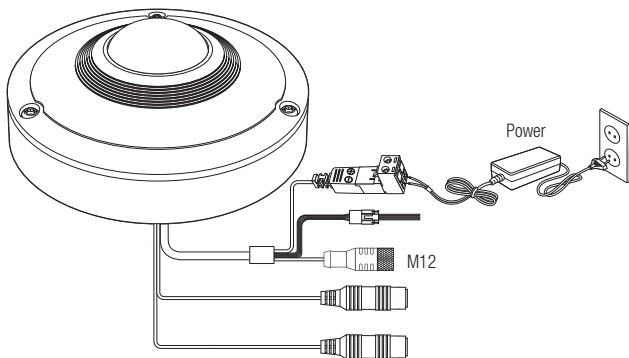
Micro SD/SDHC/SDXC



## CONNECTING WITH OTHER DEVICE



<SNF-8010>



<SNF-8010VM>

# installation & connection

---

## Ethernet Connection

Connect the Ethernet cable to the local network or to the Internet.

## Power Supply

Use the screwdriver to connect each line (+, -) of the power cable to the corresponding power port of the camera.



- If both PoE and DC12V are applied simultaneously, the product will be supplied with power from PoE.
  - You can also use a router featuring PoE to supply power to the camera.
  - Use PoE that is compliant with the IEEE802.3af protocols.
- Be careful not to reverse the polarity when you connect the power cable.
- If you want to connect an external device, you must turn off the external device before proceeding.

## Connecting a connector cable (SNF-8010VM)

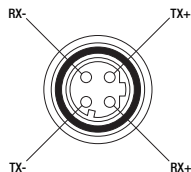
Connect the M12 male connector into the hole of the M12 Female connector of the camera.



- This camera uses Female, D-coded types.
- PoE (Power over Ethernet) is supported.
- You are recommended to use a shielded network connector.

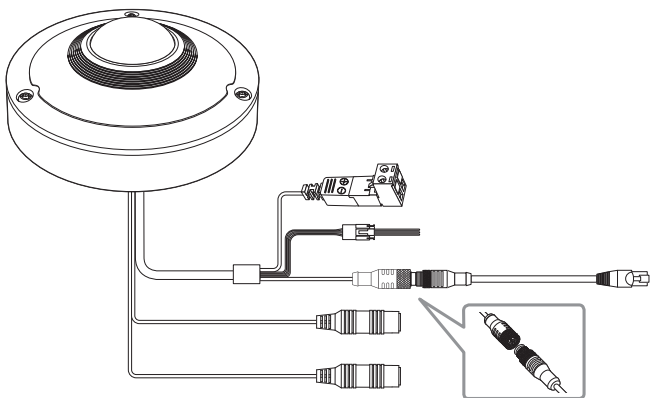


- Connect this camera to a shielded network cable (STP).
- Please, use 4 poles, Male, D-coded type external cables that meet the M12 specification.
- Check whether the PoE device is properly connected to the ground.



## Making a connection using the M12-RJ45 conversion cable provided (SNF-8010VM)

Connect the M12 male connector for the conversion cable to the groove of the M12 Female connector for your camera.



## Powering and networking (SNF-8010VM)

Connect a camera to a PoE equipment or connect the provided M12-RJ45 connector for the conversion cable of your camera to a PoE equipment.



- A connection method may vary depending on the installation environment of a user.
- Connect to a PoE (Power over Ethernet) enabled router's PoE connector.
- Use PoE (Power over Ethernet) that is compliant with the IEEE802.3af protocols.  
You can only use a Mode A PoE device that supplies power through data pin pair 1, 2, 3, 6.
- Even if you use the M12-RJ45 conversion cable provided, you can only use a mode A type PoE equipment that supplies power to data pair pins 1, 2, 3, 6.

# installation & connection

## Power Cable Specification for Each Model

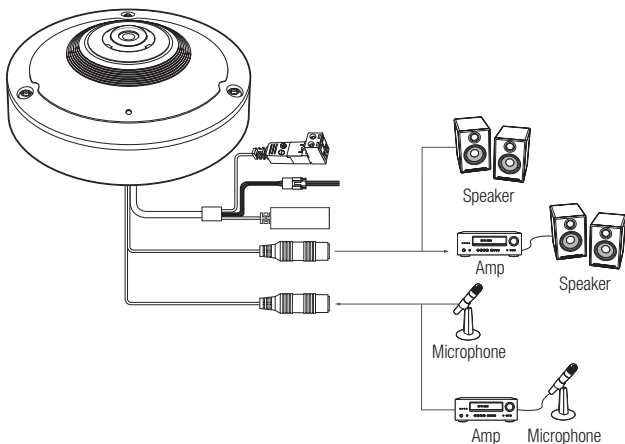
In case of DC 12V Input:

Wire Type (AWG)	#22	#20	#18
Cable Length (Max.)	24m	38m	60m

## Network Cable Specification

Item	Contents	Remark
Connector	RJ45	
Ethernet	10/100Base-T	10/100 Mbps
Cable	UTP Category 5e	
Max Distance	100M	
PoE Support	IEEE 802.3af	

## Connecting to Audio Input/Output



1. Connect the AUDIO IN port of the camera with the microphone or LINE OUT port of the amplifier that the microphone is connected to.



- As a microphone is built in, you can use the built-in microphone instead of an external one. (It is applicable only to the SNF-8010 model.)

2. Connect the AUDIO OUT port of the camera with the speaker or LINE IN port of the amplifier that the speaker is connected to.
3. Check the specifications for audio input.

### • Audio Codec

- Audio In : G.711 PCM (Bit Rate: 64kbps / Sampling Frequency: 8kHz), G.726 ADPCM (Bit Rate: 16Kbps, 24Kbps, 32Kbps, 40Kbps / Sampling Frequency: 8kHz)
- Audio Out : G.711 PCM (Bit Rate: 64kbps / Sampling Frequency: 8kHz)

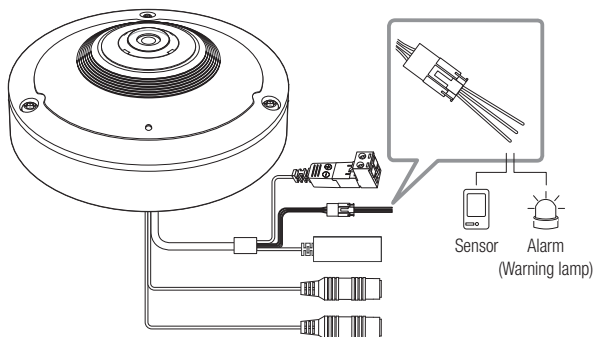
### • Full duplex Audio

- **Audio in** : Mono signal line input (Max.2.4 Vpp)
- **Audio out** : Mono signal line output (Max.2.4 Vpp)
- **Line out impedance** : 600Ω

# installation & connection

## Connecting to the I/O port box

Connect the Alarm I/O cable to the corresponding port of the port box.



- ALARM-IN : Used to connect the alarm input sensor.
- ALARM-OUT : Used to connect the alarm output signal.
- GND : Common terminal to connect alarm signals.

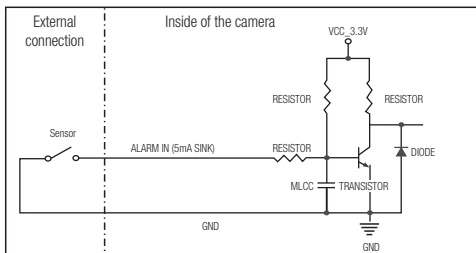


- If devices (e.g., flashing light and siren) that exceed the voltage and current specifications are connected by using the open collector method, it may cause malfunction. Refer to the **"Alarm Out Wiring Diagram"** when connecting devices that exceed the voltage and current specifications. (page 27)

## To connect the external sensor

Connect one strand of each signal line (2-strand) of the sensors to the **[ALARM IN]** port, and connect the other strand to the **[GND]** port.

### Alarm In Wiring Diagram

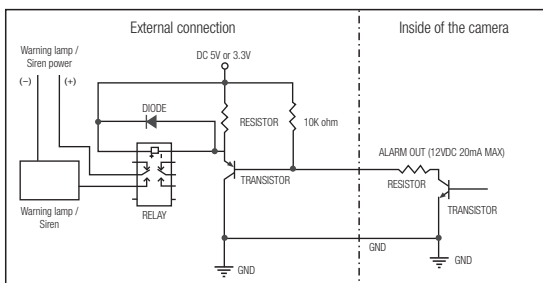


## To connect the alarm out

If devices (e.g., flashing light and siren) that exceed the voltage and current specifications are connected by using the open collector method, it may cause malfunction.

Refer to the alarm out connection diagram below when connecting devices that exceed the voltage and current specifications.

### Alarm Out Wiring Diagram



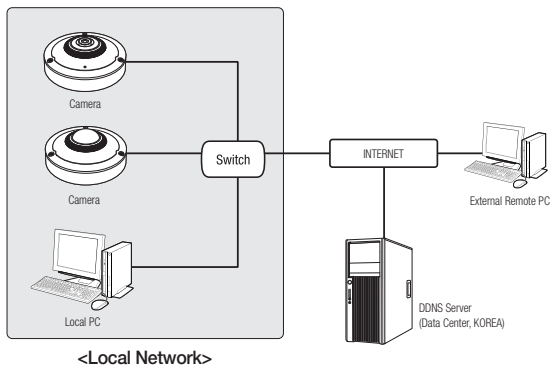
# network connection and setup

You can set up the network settings according to your network configurations.

## CONNECTING THE CAMERA DIRECTLY TO LOCAL AREA NETWORKING

### Connecting to the camera from a local PC in the LAN

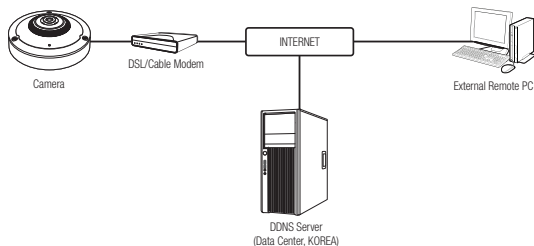
1. Launch an Internet browser on the local PC.
2. Enter the IP address of the camera in the address bar of the browser.



- A remote PC in an external Internet out of the LAN network may not be able to connect to the camera installed in the intranet if the port-forwarding is not properly set or a firewall is set. In this case, to resolve the problem, contact your network administrator.
- In the IP installer, you can use the initial password, "**4321**" to set IP Address, Subnet Mask, Gateway, HTTP Port, VNP Port, IP type. After changing the network interface, for better security, access the web viewer and change the password.
- By factory default, the IP address will be assigned from the DHCP server automatically. If there is no DHCP server available, the IP address will be set to 192.168.1.100. To change the IP address, use the IP Installer. For further details on IP Installer use, refer to "**Static IP Setup**". (Page 33)



## CONNECTING THE CAMERA DIRECTLY TO A DHCP BASED DSL/CABLE MODEM



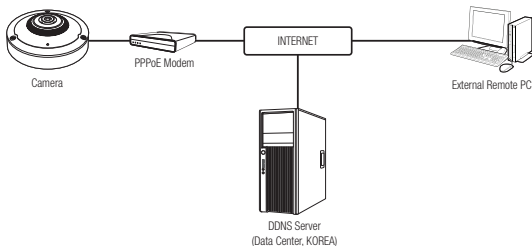
1. Connect the user PC directly with the network camera.
2. Run the IP Installer and change the IP address of the camera so that you can use the web browser on your desktop to connect to the Internet.
3. Use the Internet browser to connect to the web viewer.
4. Move to **[Setup]** page.
5. Move to **[Network]** – **[DDNS]** and configure the DDNS settings.
6. Move to **[Basic]** – **[IP & Port]**, and set the network type to **[DHCP]**.
7. Connect the camera, which was removed from your PC, directly to the modem.
8. Restart the camera.



- For registering the DDNS settings, refer to **"Registering with DDNS"**. (page 80)
- For configuring the DDNS settings, refer to **"DDNS"**. (page 79)
- Refer to **"IP & Port"** for how to setup IP. (page 65)

# network connection and setup

## CONNECTING THE CAMERA DIRECTLY TO A PPPoE MODEM



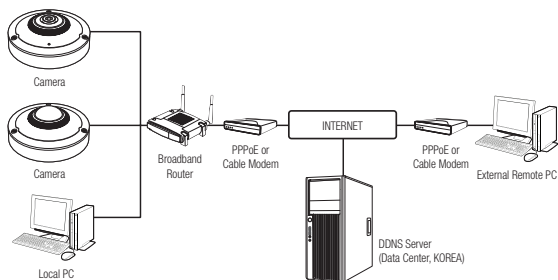
1. Connect the user PC directly with the network camera.
2. Run the IP Installer and change the IP address of the camera so that you can use the web browser on your desktop to connect to the Internet.
3. Use the Internet browser to connect to the web viewer.
4. Move to **[Setup]** page.
5. Move to **[Network]** – **[DDNS]** and configure the DDNS settings.
6. Move to **[Basic]** – **[IP & Port]** Setup Page, set the network type to **[PPPoE]**, and enter the network service's ID and password.
7. Connect the camera, which was removed from your PC, directly to the modem.
8. Restart the camera.



- For registering the DDNS settings, refer to **"Registering with DDNS"**. (page 80)
- For configuring the DDNS settings, refer to **"DDNS"**. (page 79)
- Refer to **"IP & Port"** for how to setup IP. (page 65)

## CONNECTING THE CAMERA TO A BROADBAND ROUTER WITH THE PPPoE/CABLE MODEM

This is for a small network environment such as homes, SOHO and ordinary shops.



### Configuring the network settings of the local PC connected to a Broadband Router

Configuring the network settings of the local PC connected to a Broadband Router, follow the instructions below.

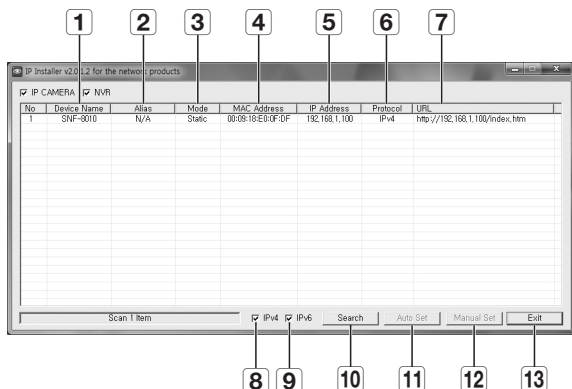
- Select : <Network> → <Properties> → <Local Area Connection> → <General> → <Properties> → <Internet Protocol (TCP/IP)> → <Properties> → <Obtain an IP address automatically> or <Use the following IP address>.
- Follow the instructions below if you select <Use the following IP address>:
  - ex1) If the address (LAN IP) of the Broadband Router is 192.168.1.1  
 IP address : 192.168.1.100  
 Subnet Mask : 255.255.255.0  
 Default Gateway : 192.168.1.1
  - ex2) If the address (LAN IP) of the Broadband Router is 192.168.0.1  
 IP address : 192.168.0.100  
 Subnet Mask : 255.255.255.0  
 Default Gateway : 192.168.0.1
  - ex3) If the address (LAN IP) of the Broadband Router is 192.168.xxx.1  
 IP address : 192.168.xxx.100  
 Subnet Mask : 255.255.255.0  
 Default Gateway : 192.168.xxx.1



- For the address of the Broadband Router, refer to the product's documentation.
- For more information about port forwarding of the broadband router, refer to "**Port Range Forward (Port Mapping) Setup**". (Page 38)

# network connection and setup

## BUTTONS USED IN IP INSTALLER



Item	Description
<b>1</b> Device Name	Model name of the connected camera. Click the column to sort the list by model name. However, search will be stopped if clicked during the search.
<b>2</b> Alias	This function is not currently implemented.
<b>3</b> Mode	Displays either <Static>, <Dynamic> or <PPPoE> for the current network connection status.
<b>4</b> MAC(Ethernet) Address	Ethernet address for the connected camera. Click the column to sort the list by Ethernet address. However, search will be stopped if clicked during the search.
<b>5</b> IP Address	IP address. Click the column to sort the list by IP address. However, search will be stopped if clicked during the search.
<b>6</b> Protocol	Network setting for the camera. The factory default is "IPv4". Cameras with the IPv6 setting will be displayed "IPv6".

Item	Description
<b>7</b> URL	DDNS URL address enabling access from the external Internet. However, this will be replaced with the <IP Address> of the camera if DDNS registration has failed.
<b>8</b> IPv4	Scans for cameras with the IPv4 setting.
<b>9</b> IPv6	Scans for cameras with the IPv6 setting. Activated in an IPv6 compliant environment only.
<b>10</b> Search	Scans for cameras that are currently connected to the network. However, this button will be grayed out if neither IPv4 nor IPv6 is checked.
<b>11</b> Auto Set	The IP Installer automatically configures the network settings.
<b>12</b> Manual Set	You should configure the network settings manually.
<b>13</b> Exit	Exits the IP Installer program.



- For the IP installer, use only the installer version provided in the installation CD or use the latest one if available. You can download the latest version from the Samsung web site ([www.samsungcctv.com](http://www.samsungcctv.com)).

## STATIC IP SETUP

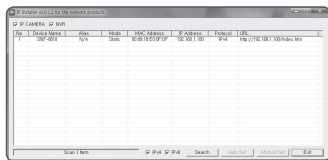
### Manual Network Setup

Run <IP Installer\_v2.XX.exe> to display the camera search list.  
At the initial startup, both [Auto Set] and [Manual Set] will be grayed out.



- For cameras found with the IPv6 setting, these buttons will be grayed out as the cameras do not support this function.

- Select a camera in the search list.  
Check the MAC address of the camera on the camera's label.  
Both the [Auto Set] and [Manual Set] buttons will be activated.
- Click [Manual Set].  
The Manual Setting dialog appears.  
<IP Address>, <Subnet Mask>, <Gateway>, <HTTP Port>, and <VNP Port> of the camera are displayed in the preset values.



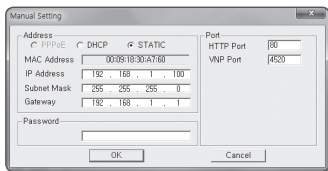
# network connection and setup

3. In the <Address> pane, provide the necessary information.

- MAC (Ethernet) Address : The MAC address imprinted on the camera label is automatically displayed and requires no user setting.



- IP related parameters can be set only when DHCP is not checked.

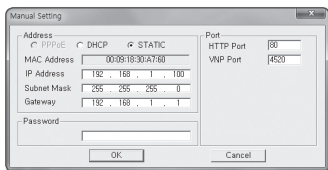


## If not using a Broadband Router

For setting <IP Address>, <Subnet Mask>, and <Gateway>, contact your network administrator.

4. In the <Port> pane, provide necessary information.

- HTTP Port : Used to access the camera using the Internet browser, defaulted to 80.
- VNP Port : Used to control the video signal transfer, defaulted to 4520.



5. Enter the password.

Enter the password of “**admin**” account, which was used to access the camera.



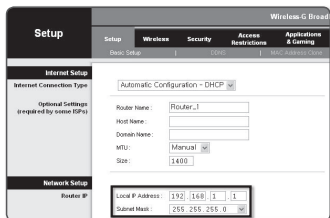
- For the security purposes, you are recommended to use a combination of numbers, alphabets uppercase and lowercase and special characters for your password.
- If you want to change the password, refer to “**Administrator password change**” of the user setup. (page 62)

6. Click [OK].

Manual network setup will be completed.

### If using a Broadband Router

- IP Address : Enter an address falling in the IP range provided by the Broadband Router.  
ex) 192.168.1.2~254,  
192.168.0.2~254,  
192.168.XXX.2~254
- Subnet Mask : The <Subnet Mask> of the Broadband Router will be the <Subnet Mask> of the camera.
- Gateway : The <Local IP Address> of the Broadband Router will be the <Gateway> of the camera.



- The settings may differ depending on the connected Broadband Router model. For more information, refer to the user manual of the applicable router.
- For more information about port forwarding of the broadband router, refer to "Port Range Forward (Port Mapping) Setup". (Page 38)

### If the Broadband Router has more than one camera connected

Configure the IP related settings and the Port related settings distinctly with each other.

ex)

Category		Camera #1	Camera #2
IP related settings	IP Address	192.168.1.100	192.168.1.101
	Subnet Mask	255.255.255.0	255.255.255.0
	Gateway	192.168.1.1	192.168.1.1
Port related settings	HTTP Port	8080	8081
	VNP Port	4520	4521



- If the <HTTP Port> is set other than 80, you must provide the <Port> number in the address bar of the Internet browser before you can access the camera.

ex) http://IP address : HTTP Port  
http://192.168.1.100:8080

# network connection and setup

## Auto Network Setup

Run <IP Installer\_v2.XX.exe> to display the camera search list.

At the initial startup, both **[Auto Set]** and **[Manual Set]** will be grayed out.



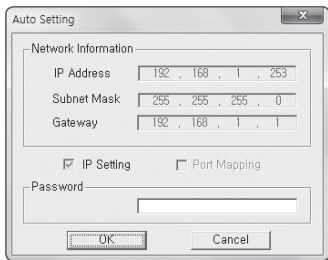
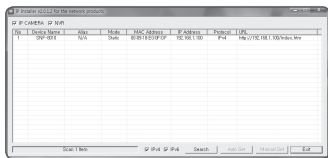
- For cameras found with the IPv6 setting, these buttons will be grayed out as the cameras do not support this function.

1. Select a camera in the search list.  
Check the MAC address of the camera on the camera's label.  
Both the **[Auto Set]** and **[Manual Set]** buttons will be activated.
2. Click **[Auto Set]**.  
The Auto Setting dialog appears.  
The <IP Address>, <Subnet Mask>, and <Gateway> will be set automatically.
3. Enter the password.  
Enter the password of "admin" account, which was used to access the camera.



- For the security purposes, you are recommended to use a combination of numbers, alphabets uppercase and lowercase and special characters for your password.
- If you want to change the password, refer to "Administrator password change" of the user setup. (page 62)

4. Click **[OK]**.  
Auto network setup will be completed.





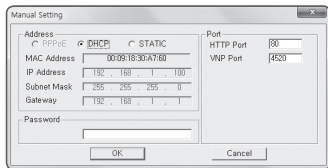
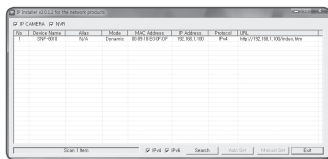
## DYNAMIC IP SETUP

### Dynamic IP Environment Setup

- Example of the Dynamic IP environment
  - If a Broadband Router, with cameras connected, is assigned an IP address by the DHCP server
  - If connecting the camera directly to modem using the DHCP protocols
  - If IPs are assigned by the internal DHCP server via the LAN

### Checking the Dynamic IP

1. Run the IP Installer on the user's local computer.  
Cameras allocated with <Dynamic IP> address are shown in the list.
2. Select a camera from the search result.
3. Click the [Manual Set] button and check the camera's <Dynamic IP> address.  
If you uncheck <DHCP>, you can change IP to <Static>.



# network connection and setup

## PORT RANGE FORWARD (PORT MAPPING) SETUP

If you have installed a Broadband Router with a camera connected, you must set the port range forwarding on the Broadband Router so that a remote PC can access the camera in it.

### Manual Port Range Forwarding

1. From the Setup menu of the Broadband Router, select **<Applications & Gaming>** - **<Port Range Forward>**.  
For setting the port range forward for a third-party Broadband Router, refer to the user guide of that Broadband Router.
2. Select **<TCP>** and **<UDP Port>** for each connected camera to the Broadband Router.  
Each port number for the Broadband Router should match that specified in **<Setup>** - **<Basic>** - **<IP & Port>** from the camera's web viewer menu.
3. When done, click **[Save Settings]**.  
Your settings will be saved.

Application	Start	End	Protocol	IP Address	Enable
P91	943	943	TCP	192.168.1.100	<input checked="" type="checkbox"/>
RTSP1	2000	2000	Both	192.168.1.100	<input checked="" type="checkbox"/>
RTSP2	2001	2001	Both	192.168.1.101	<input checked="" type="checkbox"/>
VMD1	4420	4420	Both	192.168.1.100	<input checked="" type="checkbox"/>
VMD2	4421	4421	Both	192.168.1.101	<input checked="" type="checkbox"/>
VMD1	8080	8080	Both	192.168.1.100	<input checked="" type="checkbox"/>
VMD2	8081	8081	Both	192.168.1.101	<input checked="" type="checkbox"/>
	0	0	Both	192.168.1.0	<input type="checkbox"/>
	0	0	Both	192.168.1.0	<input type="checkbox"/>
	0	0	Both	192.168.1.0	<input type="checkbox"/>



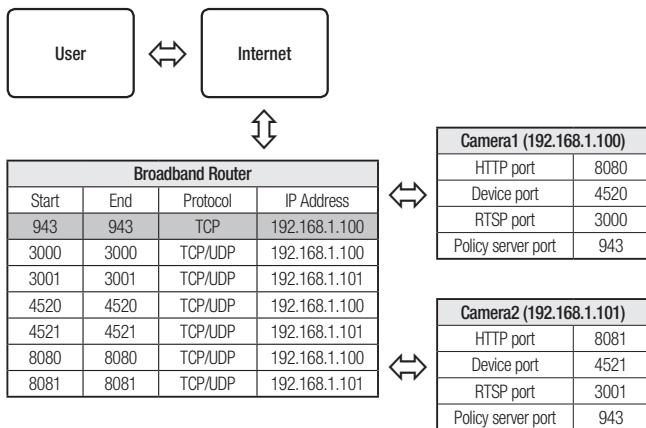
- Above sample instructions are based on the CISCO's Broadband Router.
- The settings may differ depending on the connected Broadband Router model.  
For more information, refer to the user manual of the applicable router.

## Setting up Port Range Forward for several network cameras

When several network cameras are connected to one Broadband Router device, you should forward the TCP 943 port of the router to the TCP 943 port of a connected camera.

- ! ■ If you don't set properly the TCP 943 port of the router, you cannot get any video stream from the web page of the camera.
- TCP 943 port is a port for the Silverlight policy server of a camera.
- You can set a rule of Port Forwarding on the Broadband Router device through its configuration web page.
- You cannot change the Silverlight policy server port of a camera.
- You can change the ports of the camera except the policy server port through its configuration web pages.

When Camera1 and Camera2 are connected to a router :

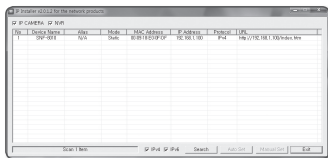


- ✍ ■ Port forwarding can be done without additional router setup if the router supports the UPnP (Universal Plug and Play) function.  
After connecting the network camera, set <Quick connect> of <Samsung DDNS> to <On> in the "Setup → Network → DDNS" menu.

# network connection and setup

## CONNECTING TO THE CAMERA FROM A SHARED LOCAL PC

1. Run the IP Installer.  
It will scan for connected cameras and display them as a list.
2. Double-click a camera to access.  
The Internet browser starts and connects to the camera.



- Access to the camera can also be gained by typing the camera's IP address in the address bar of the Internet browser.

## CONNECTING TO THE CAMERA FROM A REMOTE PC VIA THE INTERNET

Since using the IP Installer on a remote computer that is not in the Broadband Router's network cluster is not allowed, users can access cameras within a Broadband Router's network by using the camera's DDNS URL.

1. Before you can access a camera in the Broadband Router network, you should have set the port range forward for the Broadband Router.
2. From the remote PC, launch the Internet browser and type the DDNS URL address of the camera, or the IP address of the Broadband Router in the address bar.  
ex) <http://www.samsungipolis.com/Product ID>

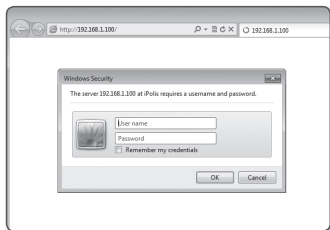


- For registering the DDNS settings, refer to "**Registering with DDNS**". (page 80)

## CONNECTING TO THE CAMERA

### Normally, you would

1. Launch the Internet browser.
2. Type the IP address of the camera in the address bar.
  - ex) • IP address (IPv4) : 192.168.1.100  
→ http://192.168.1.100
  - the Login dialog should appear.
  - IP address (IPv6) : 2001:230:abcd:ffff:0000:0000:ffff:1111  
→ http://[2001:230:abcd:ffff:0000:0000:ffff:1111] - the Login dialog should appear.



### If the HTTP port is other than 80

1. Launch the Internet browser.
2. Type the IP address and HTTP port number of the camera in the address bar.
  - ex) IP address : 192.168.1.100:HTTP Port number(8080)  
→ http://192.168.1.100:8080 - the Login dialog should appear.

### Using URL

1. Launch the Internet browser.
2. Type the DDNS URL of the camera in the address bar.
  - ex) URL address : http://www.samsungipolis.com/Product ID
  - the Login dialog should appear.



- Network connection is disabled in the LAN only environment.

## Connecting via UPnP

1. Run the client or operating system in support of the UPnP protocol.
2. Click the camera name for search.  
In the Windows operating system, click the camera name searched from the network menu.
  - The login window is displayed.

## Connecting via Bonjour

1. Run the client or operating system in support of the Bonjour protocol.
2. Click the camera name for search.  
In the Mac operating system, click the camera name searched from the Bonjour tab of Safari.
  - The login window is displayed.

## To check the DDNS address

If the camera is connected directly to the DHCP cable modem, DSL modem, or PPPoE modem, the IP address of your network will be changed each time you try to connect to the ISP (Internet Service Provider) server.

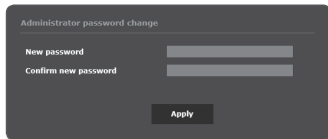
If this is the case, you will not be informed of the IP address changed by DDNS.

Once you register a dynamic IP-based device with the DDNS server, you can easily check the changed IP when you try to access the device.

To register your device to the <DDNS> server, visit [www.samsungipolis.com](http://www.samsungipolis.com) and register your device first, and then set the Web Viewer's <Network> - <DDNS> to <Samsung DDNS>, as well as providing <Product ID> that had been used for DDNS registration.

## PASSWORD SETTING

When you access the product for the first time, you must register the login password. When the “**Password change**” window appears, enter the new password.



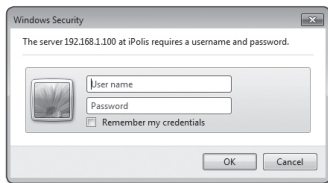
- A new password should be eight to fifteen letters long and a combination of at least two of uppercase/lowercase alphabets, numbers and special characters.
  - Special characters that are allowed. : ~!@#\$\$%^\*()\_+=|{}[].?/
- You cannot use your ID as your password. You cannot repeat same letters more than twice and you cannot use the three consecutive keyboard buttons.
- If you lost your password, you can press the **[RESET]** button to initialize the product. So, don't lose your password by using a memo pad or memorizing it.

## LOGIN

Whenever you access the camera, the login window appears. Enter the User ID and password to access the camera.

1. Enter “**admin**” in the <**User name**> input box.  
The administrator ID, “**admin**”, is fixed and can not be changed.
2. Enter the password in the <**Password**> input field.
3. Click **[OK]**.

If you have logged in successfully, you will the Live Viewer screen.



- When you access the camera web viewer, pay special attention to the security by checking whether the image data is encrypted.



- If you check the “**Remember my credentials**” option when your input is done, in future you will be logged in automatically without being prompted to enter the login information.
- You will experience the best video quality if the screen size is 100%. Reducing the ratio may cut the image on the borders.

## INSTALLING STW WebViewer PLUGIN

If connecting to a camera for the first time, you will see the installation message. Then, install the required WebViewer Plugin to access the camera and control the video from it in real time.

1. When the monitoring page is accessed for the very first time, the installation page is displayed. Click **[Click Here]** to begin installation.

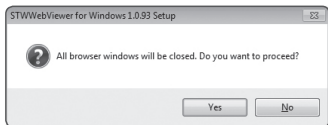


- If the plug-in installation file download status is suspended at 99% in the Internet Explorer browser, retry it after selecting "Release SmartScreen filter" in "Tool → SmartScreen filter".

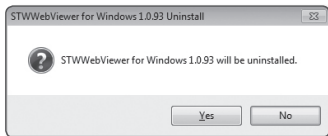
2. Click **[Run]** in the message window.



3. Click **[Yes]** when the notice window saying that all browser windows will be closed.



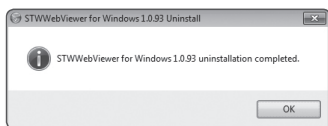
4. When the old version of the Web Viewer Plug-in is installed, a notice window saying the old version will be deleted is displayed. Click **[Yes]** when the notice window is displayed.



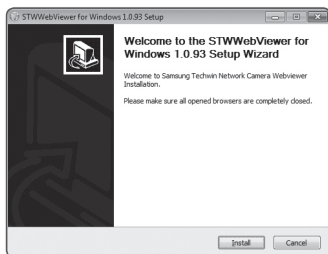
- Steps 4 and 5 will be skipped if no Web Viewer Plug-in is installed.



5. Click **[OK]**.  
The old version of Web Viewer Plug-in is deleted.



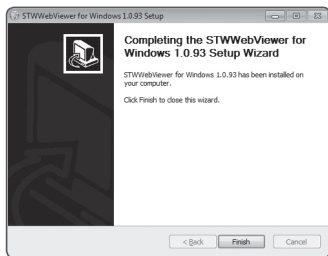
6. Click **[Install]** to begin installation of the Web Viewer Plug-in.



7. Click **[Finish]**.  
STW Web Viewer Plug-in installation is completed.



- In your internet explorer, if you need to move to the installation screen after installing the STW webviewer plugin, check whether webviewer\_activexplugin\_lib.control in the "Tool → Additional Function Management" menu is "Activated". If not, and if there is a persisting problem, then select "Tools → Internet Options → General" and delete all the search records.



## USING THE LIVE SCREEN




Item	Description
<b>1</b> Monitoring	Move to the monitoring screen.
<b>2</b> Playback	Move to the screen where you can search for the video recording saved in your Micro SD memory card or NAS.
<b>3</b> Setup	Move to the Setup screen.
<b>4</b> Profile access information	You can read the profile information.
<b>5</b> Viewer Screen	Displays the Live video on the screen. <ul style="list-style-type: none"> <li>You can use the mouse wheel to activate the digital zooming in Viewer screen.</li> </ul>
<b>6</b> Profile type	You can select a profile type in <Video profile> under the <Basic> setup menu. <ul style="list-style-type: none"> <li>When the Web Viewer is connected, the profile information currently using is displayed.</li> </ul>
<b>7</b> Screen Optimization	The video size of the camera will switch to as big as the Web browser.

Item	Description
<b>8</b> Fix the resolution	Regardless of the resolution setup configured in the camera, it sets the resolution to 640x480. Press it again to switch back to the default resolution.
<b>9</b> Full Screen	Switch the current video to the maximum size of the monitor.
<b>10</b> Capture	Saves the snapshot as an image file in the .jpg format.
<b>11</b> Manual recording	<p>You can save video on the Micro SD card.</p> <ul style="list-style-type: none"> <li>To take video manually, change the recording setting first. Refer to “Storage” for how to set recording (page 89).</li> </ul>
<b>12</b> Audio/Microphone Control	<p>Enable Audio and Microphone are control the Audio volume.</p> <ul style="list-style-type: none"> <li>Only the Audio volume can be controlled.</li> </ul>
<b>13</b> Alarm output	Activate the Alarm Out port.
<b>14</b> PTZ	Control the pan/tilt/zoom operations of the camera.
<b>15</b> Hide the context menu	The left-corner context menu will disappear but only the menu icon.



- In the WebViewer, blue noises can appear at the corner of the video images.

## To capture the snapshot

1. Click **[Capture (  )]** on the scene to capture.
2. When a captured video is saved, a notification message appears.  
When using Internet Explorer, the captured video is saved in My Computer / My Documents / Pictures.  
In Mac OS, it is saved in "~/Pictures" or "/Users/{user account}/Pictures/".



- If you encounter an interrupted video when capturing the image with IE8 on a Windows 7-based PC, deselect **"Turn On Protected Mode"** from **"Tools – Internet Options – Security"**.
- If the screen is not captured by IE browser in Windows 7 or 8, run the IE Browser with the Admin privilege.


## How to record videos manually

1. Press **[Manual recording (  )]**.
2. To end the recording, press **[Manual recording (  )]** again.



- Before starting the manual recording, at **<Event> - <Storage>**, insert the SD card and change the SD card option to **"On"**.



## To fit the full screen

1. Click the **[Full Screen (  )]** button.
2. This will fit the Viewer to the full screen.
3. To exit the full screen mode, press **[Esc]** on the keyboard.




- For the Internet Explorer and Google Chrome browser, you can switch to the full screen.

## To Use Audio

1. Click **[Audio (  )]** icon to activate audio communication.
2. Use **[  ]** bar to control the volume.





- If there is no sound from pulling in and out the audio jack while it is in operation, click the **[Audio (  )]** icon to enable it again.

## To Use Microphone

Click [Mic (  )] icon to activate the microphone.



## To control the PTZ

1. Press the [PTZ (  )] tab.
2. Adjust the direction of the camera by controlling the cursor [  ] of the screen moving pad, or control the zoom or focus.



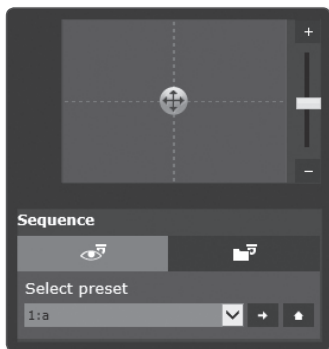
- For further details on PTZ use, refer to “DPTZ setup”. (page 67)

## To run a sequence

-  : Run a saved preset.  
Refer to “To set a group” for details of group setting. (page 69)
-  : Run a saved group.  
Refer to “To add the home position” for details of home position setting. (page 68)



- To use the sequence function, at <Dewarping mode>, select the <Single Rectangle> view, and then go to <DPTZ setup> and select the Preset option and Group.

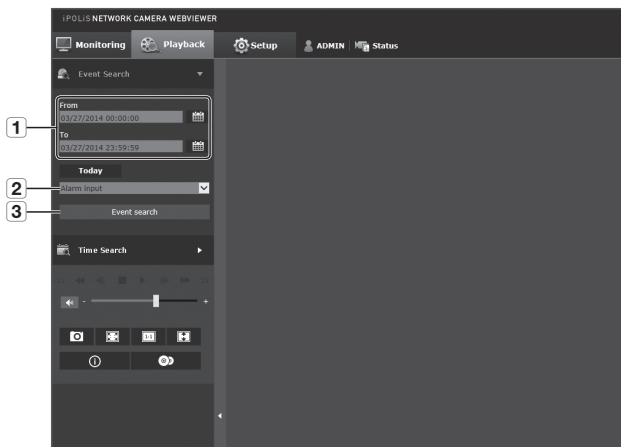


## PLAYING THE RECORDED VIDEO



- Before you can play the video, you must configure the record settings. For details on record settings, refer to “Storage”. (page 89)

### Name of event search screen and its function



Item	Description
<b>1</b> Search range setting	Set the search date and time range for data saved in your Micro SD memory card or NAS.
<b>2</b> Search event setting	Set the event type to search within the search period.
<b>3</b> Event search	Run the event search.

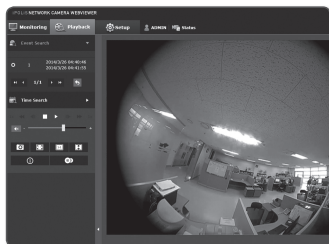
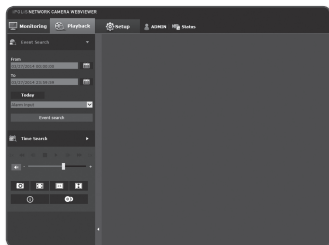
## To play the content after searching by event

1. Click the **[Playback (🔍)]** button.
2. Specify the start time and end time of your search.
3. Select an event type for your search within the specified period.
4. Click the **[Event search]** button.  
The search results will be displayed in the list.



- If more than 800 events are recorded within the search period, your search will be limited up to the date when the 800th event is recorded.  
For instance, if the search period is between 10th and 15th day of the month, and more than 800 events were recorded 10th through 11th, your search will be limited up to 11th day with a total of 800 events, and events after then (from 12th) will not be found.

5. Select a data item to play in the search list.
6. Click the **[Play (▶)]** button.
7. To stop playing the video, click **[Stop (■)]**.
8. To return to the search screen, click **[Exit (↶)]**.



## Name of time search screen and its function











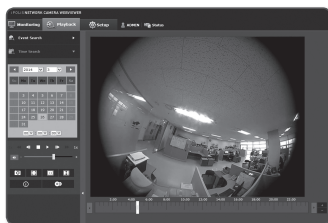
Item	Description
<b>1</b> Time bar	The section in the specific period is played by moving the time bar.
<b>2</b> Search date setting	Set the search date using the calendar. ■ If there is data saved in your Micro SD memory card or NAS on the day, it is marked as a box on the calendar.
<b>3</b> Speaker	To listen to a voice signal (if present) in the recorded video, then activate the voice signal icon when you play it.
<b>4</b> Screen optimization	The camera image is converted to fit the Web browser window.
<b>5</b> Fix the resolution	Regardless of the resolution setup configured in the camera, it sets the resolution to 800x600. Press it again to switch back to the default resolution.
<b>6</b> Capture	The current image is saved as a .jpg image file.
<b>7</b> Full screen	The current image is converted to cover the maximum size of the monitor.



Item	Description
<b>8</b> Video information	Time data of the replayed video is displayed on the screen.
<b>9</b> Backup	Set the desired date to make a backup copy of video data saved in your Micro SD memory card or NAS. ■ Can be set as up to 5 minutes.

## To play after searching by time

- Click **[Time Search ( : Select this button to move 1 frame forward.  
: Select this button to move 1 second back.**
- To control the play speed  
 If selecting , the button will switch to x1, x2, x4, x8, and the play speed will increase accordingly.  
 When the  button is selected, the playing speed is decreased to -1x, -2x, -4x, -8x and the playing speed slows down gradually. Subsequently the quick playing speed is returned to the normal speed and the reverse playing speed increases.
- To control the playback direction  
 If you see the  button with the play speed displayed, the video will be played forward; Whereas, if you see the  button with the play speed displayed, the video will be played backward.
- How to set the time bar  
 If you press the  button, the details of the time bar section can be viewed.  
 If you press the  button, you can view a wider range of times and the desired time can be selected more easily.





## To Play an AVI File

### (1) Micro SD memory card

1. Separate the Micro SD memory card from the camera.

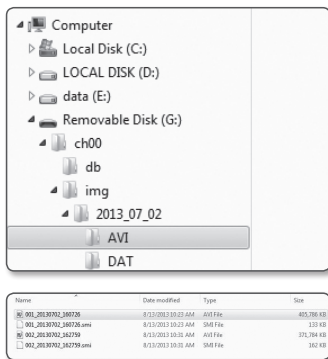
! Before separating the Micro SD memory card, set the <Device> to <Off> in the "Setup → Event → Storage" menu.

2. Insert the Micro SD memory card into the PC.

3. Play the AVI file in the "\\ch00\\img\\YYYY\_mm\_DD\\AVI" directory, using a media player.

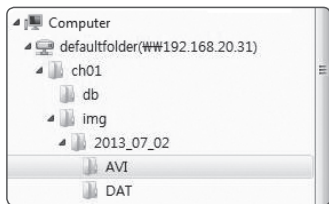
✍ A filename starts with the format "001\_YYYYMMDD\_HHMMSS.avi" and the file number is incremented by one. YYYYMMDD\_HHMMSS indicates the start time of data saving.

- "001\_YYYYMMDD\_HHMMSS.smi" file is a caption file, and you can view it if it exists in the same directory as its related AVI file.
- The max recording time per AVI file is 5 minutes.
- Once corrupted, the data in the Micro SD memory card cannot be replayed in the Web Viewer's [Playback].



## (2) NAS (Network-Attached Storage)

1. In Windows browser, use \\<ip address>\ to access.  
ex) \\192.168.20.31\defaultfolder\ch01\img\2013\_07\_02\AVI
2. Go to <Computer> → <Network drive connection> → Enter 1.
3. Connected to the NAS.  
The directory structure is same as the directory structure for a Micro SD memory card.



- A filename starts with the format "001\_YYYYMMDD\_HHMMSS.avi" and the file number is incremented by one. YYYYMMDD\_HHMMSS indicates the start time of data saving.
- "001\_YYYYMMDD\_HHMMSS.smi" file is a caption file, and you can view it if it exists in the same directory as its related AVI file.
- The max recording time per AVI file is 30 minutes.
- If you change or damage the saved data on your own, it will not play back or save properly.

Name	Date modified	Type	Size
001_20130702_140726	8/13/2013 10:23 AM	AVI File	455,786 KB
001_20130702_140726.smi	8/13/2013 10:23 AM	SMB File	133 KB
002_20130702_142759	8/13/2013 10:31 AM	AVI File	371,784 KB
002_20130702_142759.smi	8/13/2013 10:31 AM	SMB File	162 KB

# setup screen

## SETUP

On the network, you can set up basic information on the camera, video and audio, network events and system.

1. In the Live screen, click **[Setup ( Setup )]**.

2. The Setup screen appears.

! ■ The setting page for preview video requires the STW web viewer plug-in to be installed on the PC. If not installed already, automatically moves to the Silverlight setup.

## BASIC SETUP

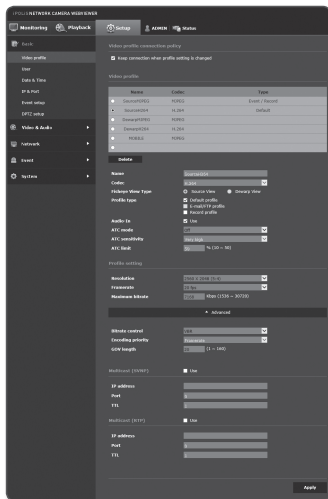
### Video profile

1. From the Setup menu, select the **<Basic ( Basic )>** tab.

2. Click **<Video profile>**.

3. Set the **<Video profile connection policy>**.

- Keep connection when profile setting is changed : Changing profile properties that is used by existing connection does not affect such connection and remains with old profile setup. If not selected, changing a profile used by an existing connection resets such connection.



# setup screen

4. Select each profile properties.

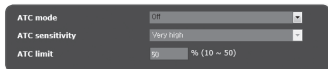
For more details, refer to “**To Add/Change the Video Profile**”. (Page 60)

5. Click the input box of each item and enter / select a desired value.

- The context menu may differ depending on the selected codec type.
- Default profile : If no profile is selected when using the Web Viewer, the default video profile is applied.
- E-mail/FTP profile : Video profile to be transferred to the specified email or FTP site.
  - Only the MJPEG codec can be set as the E-mail/FTP profile.
- Record profile : This is the profile that is applied to video recording.
- Audio-In : Sets whether to use audio for video recordings.

6. According to your situation, set ATC (Auto Transmit Control) mode.

- ATC mode : It adjusts the video properties according to the variance in the network bandwidth, controlling the bit rate. Adjusting the bit rate depends on the ATC mode.
  - Control framerate : Reduce the frame rate if the network bandwidth drops down.
  - Control compression : Control the compression rate if the network bandwidth drops down.  
Compression adjustment can cause deterioration of the image quality.
- If <**Bitrate control**> is set to <**CBR**>, the encoding priority according to the ATC mode will be fixed as below:



Bitrate control / ATC mode	Control framerate	Control compression
CBR	Framerate	Compression

- ATC sensitivity : Affect the transfer rate according to the variance in the network bandwidth.

The transfer rate will be adjusted to the fastest if the bandwidth is <Very high>, and adjusted to the latest if the bandwidth is <Very low>.

- ATC limit : If the quality or frame rate is adjusted, the property will be changed to the applied value (%) against the previous setting value (100%).  
Note that if you reduce the property value too much, you may encounter flickering on the screen. So it is advisable to adjust the value within the threshold.



- It is recommended to apply ATC control only for cameras supporting ATC.
- Set the ATC sensitivity to <Very low> in a network environment with high variance in the network bandwidth.
- If the network connection is unstable, you may encounter flickering on the screen.

7. When done, click [Apply ( 



- View modes of Distortion Compensation may influence the video resolutions.

## To Add/Change the Video Profile

The profile setup can be added or modified to accommodate various profiles depending on the recording conditions.

1. Select one from the <**Video profile**> options.
2. Provide the name and select a codec.
3. Specify the conditions under which the codec will be applied.
4. Select the type of the Fish Eye View.
  - Source View : Shows the original video images from camera.
  - Dewarp View : Calibrates the system to show the 360° wrap-around view of the video images.
5. Specify the details of the selected codec including resolution and frame rate.  
Click <**Advanced**> to display the context menu.
  - Resolution : Set the video size of the H.264 and MJPEG files.
  - Framerate : Set the max number of video frames per sec.
  - Maximum bitrate : Set the max bit rate of video when the bit rate control is set to VBR.



- As the bit rate can be adjusted limitedly according to the resolution, frame rate and screen complexity, the actual bit rate can be greater than the maximum bit rate. So you must consider the use conditions when setting the value.

- Target bitrate : Set the target bit rate when the bit rate control is set to CBR.
- Bitrate control : You can select one from constant bit rate and variable bit rate for compression. Fixed bitrate means that the network transmission bitrate is fixed while varying the video quality or frame rate, variable bitrate means that a higher priority is placed on the video quality while varying the bitrate.



- After setting the fixed bit rate for bit control, if you select the video quality priority mode, depending on the complexity of the screen, the actual transmitted frame rate may differ from the frame rate setup in order to guarantee the optimal video quality for the given bit rate.



- Encoding priority : You can set the priority of video transmission to frame rate or compression.
- GOV length : It specifies the distance (in terms of number of frames) between two consecutive I-Frames in a video sequence when H.264 codec was selected. (One I-Frame + 0~Several P-Frames)
- Multicast(SVNP) : Specify the use of the SVNP protocol.
  - IP address : Enter an IPv4 address with which you can connect to the IPv4 network.
  - Port : Specify the video communication port.
  - TTL : Set the TTL for the SVNP packet.
- Multicast(RTP) : Specify the use of the RTP protocol.
  - IP address : Enter an IPv4 address with which you can connect to the IPv4 network.
  - Port : Specify the video communication port.
  - TTL : You can set the TTL for the RTP packet.



- If you set the Multicast address to 224.0.0.0~224.0.0.255, multicast may not work properly in all environments. In that case, we recommend you change the multicast address.

## What is GOV length?


GOV(Group of Video object planes) is a set of video frames for H.264 compression, indicating a collection of frames from the initial I-Frame (key frame) to the next I-Frame. GOV consists of 2 kinds of frames: I-Frame and P-Frame.

I-Frame is the basic frame for the compression, also known as Key Frame, which contains one complete image data. P-Frame contains only the data that has changed from the preceding I-Frame.

For H.264 codec, you can determine the GOV length. (1~160)

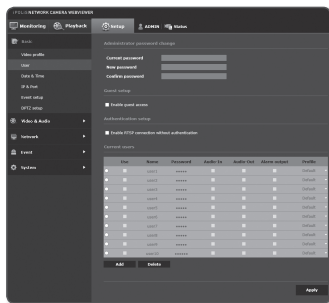
# setup screen



## User

1. From the Setup menu, select the <Basic (  )> tab.
2. Click <User>.
3. Provide the necessary user information.
  - Administrator password change :  
Change the password for the administrator.



- For the security purposes, you are recommended to use a combination of numbers, alphabets uppercase and lowercase and special characters for your password.
- It is recommended to change your password once every three months.
- The password length and limits are shown as follows.
  - A combination of at least two types of upper case, lower case, numeric, and special characters: 8 to 15 characters.
  - Should be different from the ID.
  - Cannot repeat the same letter, number of special characters more than three times.
  - Cannot use three consecutive letters (e.g. abc, 123, 321, or ASCII code values in the sequential increasing or decreasing order)
  - Special characters that are allowed: ~!@#\$%^&\*()\_+=|{}[]?/
  - When accessing the camera webpage for the first time after factory reset, the change password menu appears. A user account and its password are set to user1 to user 10 for each.
  - When you access the camera web page for the first time or access it after the initialization, you will be moved to the admin password setting menu.
  - In this menu, you need to login again with the new password before using the camera web page menus.

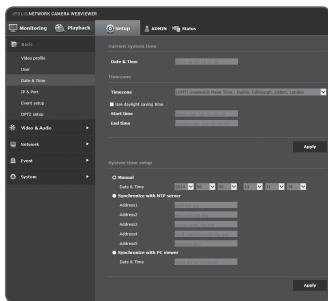


- If the existing password is not matched, when you change the admin password, you cannot change the password.
  - After changing your password, if there is a camera connected to a CMS or NVR client, then you need to re-register it with the newly changed password. If the camera is still connected with the same password, then the account may be locked because a client uses the previous password.
  - If you try to login with the registered account, 5 or more consecutive password authentication has failed, and then the account may be locked for thirty seconds.
  - When the password is changed while multiple connections are active from a PC, the browser may malfunction. In that case, reconnect to the server.
- Guest setup : If you select **<Enable guest access>**, the guest account can access the Web viewer screen but can only view the live Viewer screen.
    - The ID/password for the guest account is **<guest/guest>**, which cannot be changed.
  - Authentication setup : If you select **<Enable RTSP connection without authentication>**, you can access RTSP without logging in and view the video.
  - Current users : If you select **<Use>**, you can set or change the user permissions.
    - The manager can set up audio input/output and alarm output.
    - Profile : If you select **<Default>**, you can only see the default profile video; if selecting **<All>**, you can see the full profile videos.
-  ■ ONVIF functions available to a registered user allowed to use ONVIF functions are limited to those of granted with permission.
- Video Transfer and Changing Video Information: Set the profile to **<All>**, and set Audio Input and Audio Output.
  - Video Transfer, Changing Video Information, Alarm Output : Set the profile to **<All>**, and select at your preference for the rest.
4. When done, click **[Apply (  )]**.

# setup screen



## Date & Time

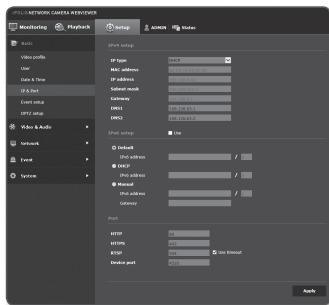
1. From the Setup menu, select the **<Basic (🖥️)>** tab.
2. Click **<Date & Time>**.
3. Specify the time and date that will be applied to the camera.
  - **Current system time** : Displays the current time settings of your system.
  - **Timezone** : Specify the local time zone based on the GMT.
  - **Use daylight saving time** : If checked, the time will be set one hour before the local time zone for the specified time period. This option will be displayed only in areas where DST is applied.
  - **System time setup** : Specify the time and date that will be applied to your system.
    - **Manual** : Specify the time manually.
    - **Synchronize with NTP server** : Sync with the time of the specified server address.
    - **Synchronize with PC viewer** : Sets to the time of the computer connected.
4. When done, click **[Apply (🔍)]**.




- ! ■ If you select the **<Synchronize with PC viewer>**, the standard timezone should be set the same as the current timezone in PC.

## IP & Port

1. From the Setup menu, select the **<Basic (  )>** tab.
  2. Click **<IP & Port>**.
  3. Set the **<IPv4 setup>**.
    - IP type : Select an IP connection type.
      - Manual : Specify the IP address, Subnet mask, Gateway, DNS1, and DNS2.
      - DHCP : Specify the DNS1 and DNS2.
      - PPPoE : Specify the DNS1, DNS2, ID and Password.
    - If you set it to **<Manual>**, you should specify the IP, Subnet mask, Gateway, DNS 1 & 2 manually.
    - MAC address : Shows the MAC address.
    - IP address : Displays the current IP address.
    - Subnet mask : Displays the **<Subnet mask>** for the set IP.
    - Gateway : Displays the **<Gateway>** for the set IP.
    - DNS1/DNS2 : Displays the DNS(Domain Name Service) server address.
  4. Set the **<IPv6 setup>**.
    - Set to **<Use>** to use IPv6 address.
    - Default : Use the default IPv6 address.
    - DHCP : Display and use the IPv6 address obtained from the DHCP server.
    - Manual : Enter IP address and gateway manually and use it.
- ! ■ The IP addressing system will be defaulted to DHCP. If no DHCP server is found, the previous settings will be restored automatically.
- Once completed with editing, click **[Apply (  )]** to apply changes and the browser exits. After a while, connect again with the changed IP.






# setup screen

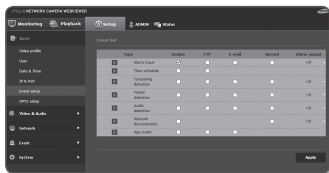
- Type in each item in the Port menu as necessary.
  - Neither the port range between 0 and 1023 nor port 3702 is available.
  - HTTP : HTTP port used to access the camera via the web browser. The default is 80(TCP).
    - Setting the HTTP port for Safari and Google Chrome browsers to 65535 is not allowed by security policy.
  - HTTPS : In this version, the security of the web communication protocol HTTP is strengthened. It can be used when you set HTTPS mode in SSL. The initial value is set to 443(TCP).
    - The available setting range is 1024~65535. (For security reasons, in your Safari or Google Chrome browser, you may not use 65535 as your HTTPS port.)
  - RTSP : Used to transfer videos in the RTSP mode; the default is 554.
  - Use timeout : When connecting to RTSP, this function resets the connection if there's no response for a certain time.
  - Device port : Set a port used to transfer video signals with the Samsung protocols.
-  If changed the HTTP port, the browser exits. Afterwards, address should contain the newly assigned HTTP port trailing the IP. ex) IP address: 192.168.1.100, HTTP port : Assigned 8080 → http://192.168.1.100:8080 (If HTTP port is set to 80, no need to specify the port number)

- When done, click **[Apply ( 

## Event setup**


You can easily set the event detection items, and move to the detailed setting.

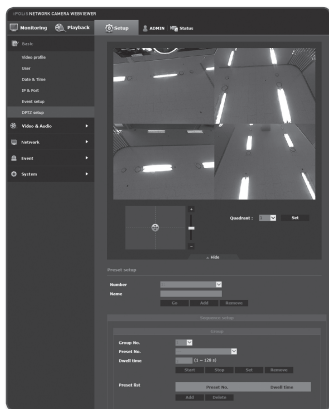
- From the Setup menu, select the **<Basic (  )>** tab.
- Click **<Event setup>**.
- Activate desired items on the Event list.
- When done, click **[Apply ( 
  -  To make detailed event settings, click on your desired settings. Go to detailed **<Event>** setting.**



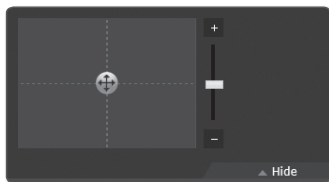
## DPTZ setup


Use this settings page to move the camera view and perform the digital zoom.

1. Select the **<Basic ( [Basic Icon] )>** tab from Setup menu.
  2. Click **<DPTZ setup>**.
  3. Click **[▼ Show]**.
    - Quadrant : In the Distortion Compensation view, select locations where you want to place split-screens.
-  ■ To use Preset and Grouping in **<DPTZ setup>** function, select the **<Single Rectangle>** view, at **<Dewarping mode>**.
- DPTZ methods can vary depending on **<Dewarping mode>** and **<Dewarp View>** in **<Video profile>**.  
To see how to use the function, refer to **"Dewarping mode"**. (page 71)



4. Click the cursor **[+]** on the screen moving pad to control movement of the screen.
  - Move screen: Scroll the cursor in the direction desired.
  - Control screen movement rate: The farther the cursor is from the center of the screen, the faster the screen moves.
5. Control zoom movement.
  - Zoom In: Move up the bar in the right of the UI, or press the **[+]** button. The farther the bar is from the center, the faster the screen expands.
  - Zoom Out: Move down the bar in the right of the UI, or press the **[-]** button. The farther the bar is from the center, the faster the screen reduces in size.





-  ■ When performing the sequence action at a high or low temperature, the system may respond slower than the set rate for accurate sequence action.

# setup screen

---


## To add the home position

1. Move to a desired start screen point and press [  ].  
The point will be set to the home position.
2. Click [  ] in the home position. You will move to the predetermined home position.
3. When the camera is rebooted after setting, the screen is located at the home position. (If the camera was on another sequence operation, the sequence is performed.)




- To activate the Home position function, select Single Rectangle in the <Dewarping mode>.


## To add a preset

1. Select the preset number to add.
2. Set the name for the preset.
3. Press the [  ] button.

## To delete a preset

1. Select the preset number to delete.
2. Press the [  ] button.

## To move to a desired preset

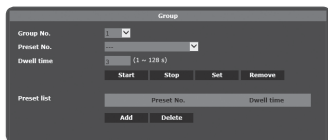
1. Select a preset number that you want to move.
2. Press the [  ] button.



## To set a group

The group function enables you to group various presets before calling them in sequence. Six groups can save a total of 128 presets each.



1. Select a group setting mode.
2. Press the [ **Add** ] button.  
Entered in the bottom list.
3. If you want to delete a preset added, select it and press the [ **Delete** ] button.
4. Press the [ **Set** ] button.  
Saved in the bottom list.
5. Press the [ **Start** ] button.  
It performs the group operation.
6. Press the [ **Stop** ] button.  
The running group will be stop.
7. Press the [ **Remove** ] button.  
Selected group data will be deleted.

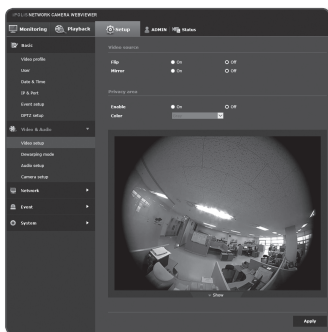


# setup screen

## VIDEO & AUDIO SETUP



### Video setup

1. From the Setup menu, select the **<Video & Audio (  )>** tab.
2. Click **<Video setup>**.
3. Select a **<Video source>** mode.
  - Flip : Turns the camera images upside down.
  - Mirror : Interchanges the left and the right of the camera images.
4. Specify the privacy zone.
5. When done, click **[Apply (  )]**.



### To set the privacy zone


You can specify a certain area of the camera video to be protected for your privacy.

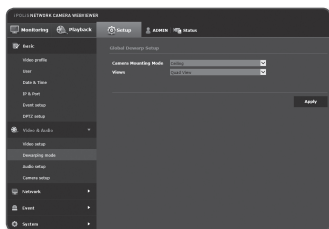
1. Set it to **<On>**.
2. Select the color masking of desired privacy area.
3. When done, click **[Apply (  )]**.
4. Click **[▼ Show]**.
5. Place the cursor at a point in the video and drag it to whatever you need.
6. Check if the area shown on the screen matches with the target area, type the name, and click the **[OK]** button.  
If the displayed area does not match with the set area, click **[Cancel]** and reset the area.
7. If you want to delete a name in the list, select it and click **[Delete (  )]**.




## Dewarping mode

Sets the camera position and give the information to the user program.

1. From the Setup menu, select the <Video & Audio (  )> tab.
2. Click <Dewarping mode>.
3. Set <Camera Mounting Mode>.
  - Ceiling : Select this for ceiling-mounted cameras.
  - Ground : Select this for cameras placed on the floor.
  - Wall : Select this for cameras placed on the wall.



4. Set <Views>.
  - Quad View : Shows four Single Rectangle screens at the same time. However, Quad View does not support DPTZ at [Monitoring]. It does not allow the image reversion or zoom for a selected area at <DPTZ setup>. Quad View is available in Wall-mounted, Ceiling mounted and Floor Standing modes.
  - Double Panorama : Shows the calibrated video images of the 360° wrap-around view of the areas that are valid for Wall-mounted and Ceiling mounted modes. Can set the initial position at the [Setup] menu. Can flip images horizontally through <DPTZ setup>. Available in Wall-mounted and Ceiling mounted modes.
  - Single Panorama : Shows the calibrated video images of the 360° wrap-around view of the areas that are valid for Wall-mounted mode. Can set the initial position at the [Setup] menu, but does not support the DPTZ function. Available in Wall-mounted mode.
  - Single Rectangle : Calibrates a specific scene to be optimized for a viewer. Can adjust DPTZ at [Monitoring], and allows the image reversion or zoom for a selected area at <DPTZ setup>. Available in Wall-mounted, Ceiling mounted and Floor Standing modes.
5. When done, click [Apply (  )].



- When you change the Camera Mounting mode, the camera reboots automatically.

# setup screen

## Audio setup


You can configure the I/O settings of the audio source from the camera.

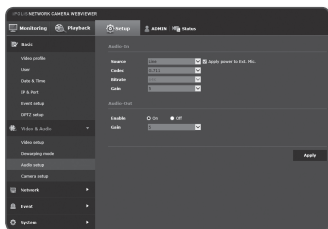
1. From the Setup menu, select the <Video & Audio (  )> tab.
2. Click <Audio setup>.
3. Set the audio input value.

- Source : Sets the audio input.
  - Line : Connect the cable to the audio device.
  - Internal microphone : Microphone that is built-in in the camera. (It is applicable only to the SNF-8010 model.)
  - External microphone : 3.5 pi(c) jack type external MIC.
- Apply power to Ext. Mic. : If the external microphone connected has no separate power supply, check this option to set camera to supply power to the connected external microphone. The option is enabled if <External microphone> is selected.
- Codec : Specify the audio codec.
  - G.711 : A audio codec standard, it uses 64 Kbps PCM (Pulse Code Modulation) encoding. ITU standard audio codec that is adequate for digital voice transfer in PSTN network or through a PBX.
  - G.726 : ITU standard audio codec applying ADPCM (Adaptive Differential Pulse Code Modulation) for variable bit rates of 40/32/24/16 Kbps to 64 Kbps PCM encoding.
- Bitrate : Set the bit rate to differentiate compression ratio if using G.726 codec.
- Gain : Specify the audio input amplification.






- Sound quality deterioration or howling may occur if the loudness of the sound source or gain value were set excessively.

4. Set the audio output level.
  - Enable : Sets whether to use audio output.
  - Gain : Specify the audio output amplification.
5. When done, click [Apply (  )].



## Camera setup

You can change the camera settings according to the environment where the camera is located.

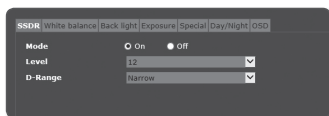
1. From the Setup menu, select the **<Video & Audio (  >** tab.
2. Click **<Camera setup>**.
3. Configure the settings as necessary of :  
SSDR, White balance, Back light, Exposure, Special, Day/Night, OSD
4. When done, click **[Apply (  )]**.
  - If a certain time (timeout: 240s) is elapsed with your not pressing the **[Apply (  )]** button after changing the settings, your changes will not be applied.



### To Set SSDR (Samsung Super Dynamic Range)

In a scene where the difference between bright and dark is severe, you can increase the brightness of the dark area alone to regulate the overall brightness.

1. Select **<SSDR>**.
2. Set **<Mode>** to **<On>**.
3. Configure the **<Level>** and **<D-Range>** settings as necessary.
  - Level : Adjust the level of the dynamic range.
  - D-Range : Select the amplitude area of the dynamic range.



# setup screen

## To Set White Balance

You can correct the image colors based on white under any lighting conditions.

1. Select <White balance>.

2. Select <Mode>.

- ATW : Corrects the colors of the camera video automatically.
- Manual : You can adjust the red and blue gains of the camera video manually.
- AWC : Corrects the colors of the camera video to be optimized to the current lighting condition and screen mode.

To obtain the optimal condition for the current lighting, put the focus of the camera to a white paper and press the **[Set]** button. If the lighting environment is changed, you should readjust the settings accordingly.

- Outdoor : Automatically corrects the video colors of the camera to be optimized to the outdoor environment.
- Indoor : Automatically corrects the video colors of the camera to be optimized to the indoor environment.



- In AWC mode, click the **[Set]** button if you want to keep the white balance level of the current image.

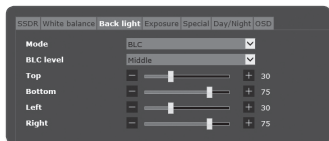


- The white balancing may not work properly in the following conditions:  
If this is the case, switch to AWC mode.
  - If the surrounding condition of the object is out of the temperature correction range  
ex) Clear sky, sunset
  - If the surrounding of the object is dark
  - If the focus of the camera directly faces the florescent lighting or if the camera is installed in a place of variable illumination, the white balancing operation may be unstable.

## To Set BLC

You can specify a desired area on the video manually and set the area to be displayed more clearly.

1. Select <Back light>.
2. Set <Mode> to <BLC>.
3. Set <BLC level>.  
You can change the level to adjust the brightness of the monitoring area.
4. Set the <Top, Bottom, Left, Right> levels to specify the target area.



- When BLC is set, the green box is displayed on the screen for 15 seconds.
- To prevent malfunction at the time of BLC setup, the vertical space of the BLC area should be over 40 and below 60 while the horizontal space over 30 and below 60.

# setup screen

## To Set Exposure

You can adjust the exposure level of the camera.

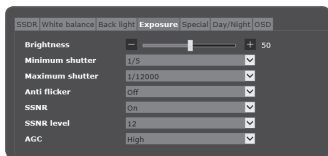
1. Select <Exposure>.

2. Select each item and set it properly.

- Brightness : Adjust the screen brightness.
- Minimum shutter : The limit of the longest exposure time.
  - Shutter is the mode to set up the range of the sensor exposure time which will specify the upper and lower limits for the electronic shutter movement.
- Maximum shutter : The limit of the shortest exposure time.
- Anti flicker : It prevents screen flickering incurring from the dissonance between the surrounding lighting and the frequency.
- SSNR : Select Able or Disable for the video noise elimination function.
  - When AGC mode is set to <Off>, you cannot use SSNR.
- SSNR level : Adjust the noise reduction level.
- AGC : Select AGC Control mode.

Adjust the gain value of the video (that, in particular, was recorded at a low contrast scene and had a lower brightness level than normal) to control the video brightness.

  - When AGC mode is set to <Off>, you cannot use SSNR and the <Auto> function of the DAY/ NIGHT mode.



- The image exposure can be saturated depending on the Shutter setup range.

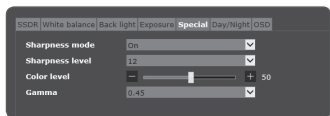


## To Setup Special

### 1. Select <Special>.

### 2. Select each item and set it properly.

- Sharpness mode : Adjust the overall sharpness of the image.  
If selecting <On>, you can adjust the sharpness of the image.
- Sharpness level : The higher the level is, the sharper and clearer the outline of the image becomes.
- Color level : Adjust the strength of video color.
- Gamma : Adjust the contrast of the image.

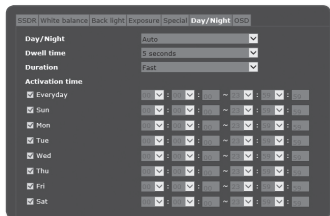


## To Set Day/Night

### 1. Select <Day/Night>.

### 2. Select each item and set it properly.

- Day/Night : Mode is used to adjust the color of Color or Black and White.
  - Color : The video is always output in color.
  - B/W : The video is always output in black and white.
  - Auto : Normally, it is set to Color but to B&W under low luminance at night.
    - If AGC of the <Exposure> menu is set to <Off>, the day/night mode cannot be set to <Auto>.
  - Schedule : Set the time during which the camera is operated in the color mode.
- Dwell Time : It specifies the period for which the selected brightness condition must be maintained to switch the lighting mode from Day to Night or vice versa.
- Duration : It specifies the interval of lighting mode conversion.
- Activation time : It specifies the schedule for color mode operation.
  - If it is set, the Color mode is maintained from 00 second of the starting time to 59 second of the ending time.



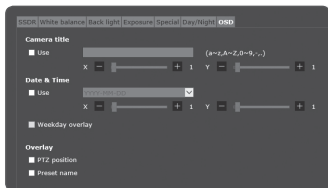
# setup screen

## OSD Setup

1. Select <OSD>.

2. Select each item and set it properly.

- Camera title : Specify whether or not to display the camera title on the screen.
  - You can enter up to 15 characters for the title.
- Camera title X, Y : Specify the coordinates where the camera title is displayed on the screen.
- Date & Time : You can set the date and time, and if they should be displayed on the screen.
- Date & Time X, Y : Set the position of time to be displayed on the screen.
- Weekday overlay : You can display the day on the screen.
- PTZ position : Set the PTZ location on the screen.
- Preset name : Specify whether or not to display preset name on the screen.



- A position-adjustable item (Camera title, Date & Time) may not be displayed normally if it overlaps with another fixed OSD item.
- PTZ position appears on the bottom left of the screen and it cannot move to other area. Use this information when placing other items on the screen.


# NETWORK SETUP

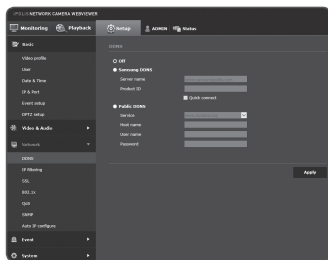
## DDNS


DDNS is an abbreviation of Dynamic Domain Name Service that converts the IP address of a camera into a general Host Name so that the user can easily remember it.



- You can use the DDNS service only if the internet is connected.

1. From the Setup menu, select the <Network (  )> tab.
2. Click <DDNS>.
3. Select the <DDNS> connection type.
4. Type in the DDNS items according to the selected type.



- Samsung DDNS : Select this if you use the DDNS server provided by Samsung Techwin.
  - Product ID : Enter the product ID that is registered with the Samsung DDNS service.
  - Quick connect : It sets port forwarding automatically when used with a UPnP (Universal Plug and Play) supporting router.
-  ■ If you want to use the DDNS service without using a hub that supports the UPnP function, click Quick connect, then go to the hub menu and activate port forwarding for your hub. For more on how to set port forwarding for your hub, refer to "**Port Range Forward (Port Mapping) Setup**". (page 38)
- Public DDNS : Select one of provided public DDNS servers when you use a public DDNS server.
  - Service : Select desired public DDNS service server.
  - Host name : Enter the name of the host that is registered with the DDNS server.
  - User name : Enter the user name for the DDNS service.
  - Password : Enter the password for the DDNS service.

5. When done, click [Apply (  )].



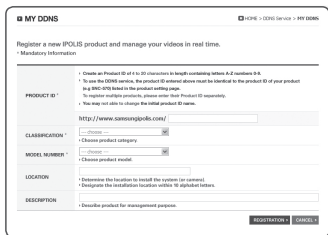
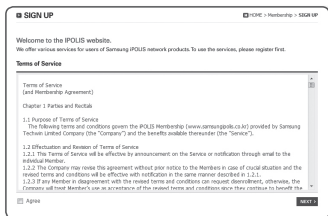
- If selected <Quick connect>, be sure to select Samsung DDNS service.

# setup screen


## Registering with DDNS

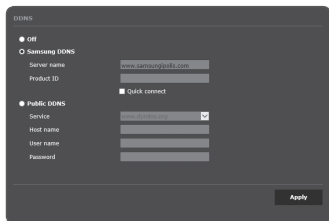
### To register your product with the Samsung DDNS

1. Visit the iPOLiS web site ([www.samsungipolis.com](http://www.samsungipolis.com)) and sign in with a registered account.
2. From the top menu bar, select **<DDNS SERVICE>** - **<MY DDNS>**.
3. Click **[PRODUCT REGISTRATION]**.
4. Enter the product ID.
  - You must perform the duplicate check for the ID that you entered.
5. Select a **<CLASSIFICATION>** and specify the **<MODEL NUMBER>**.
6. Specify the product location with a description if necessary.
7. Click **[REGISTRATION]**.  
The product will be added to the product list that you can check.





## To connect to the Samsung DDNS in camera setup

1. From the DDNS setup page, set **<DDNS>** to **<Samsung DDNS>**.
2. Provide the **<Product ID>** that you registered product ID with the DDNS site.
3. Click **[Apply (  )]**.  
When the connection is successfully made, you will see the message of **<(Success)>** on the screen.



## Configuring public DDNS in Camera Settings

1. Open the DDNS settings page and select **<Public DDNS>** for **<DDNS>**.
2. Enter the corresponding site's host name, user name and password.
3. Click **[Apply (  )]** button.  
If the connection properly establishes, **<(Success)>** appears.
4. When done, click **[Apply (  )]**.



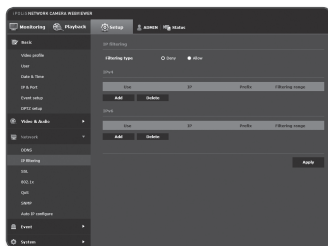
- To use DDNS service properly, both DDNS setup and the router's port forwarding setup are required.  
For port forwarding setup, refer to "**Port Range Forward (Port Mapping) Setup**". (page 38)

# setup screen

## IP filtering

You can create a list of IPs that you want to grant or deny access to them.

1. From the Setup menu, select the **<Network (🖥️)>** tab.
2. Click **<IP filtering>**.
3. Select **<Filtering type>**.
  - Deny : If selecting this, access from those IPs that are added to the filtering will be restricted.
  - Allow : If selecting this, access from only those IPs that are added to the filtering will be accepted.





4. Click the **[Add (Add)]** button.  
The IP list will be created.
5. Provide the IP that you want to grant or deny access from.  
When you enter an IP address and a Prefix, the list of IP addresses available will appear in the right-side filter range column.

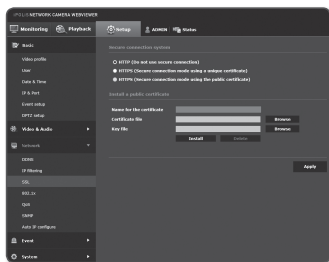
- If selected **<Allow>** for IP Filtering and **<IPv6 setup>** of **<IP & Port>** is set to **<Use>**, both IPv4 and IPv6 addresses of the computer currently configuring should be assigned.
- The IP address of the computer used for the current setup cannot be added to **<Deny>**, it should be added to **<Allow>**.
- Only the IP addresses that are set to **<Use>** will be displayed in the filter column.

6. Select an IP to delete from the list.  
Click the **[Delete (Delete)]** button.
7. When done, click **[Apply (Apply)]**.



## SSL

You can select a secure connection system or install the public certificate for this purpose.


1. From the Setup menu, select the **<Network (  )>** tab.
2. Click **<SSL>**.
3. Select a secure connection system.
  - To access the camera using HTTPS mode, you have to type the IP address for the camera in the form of "https://<Camera\_IP>". If you failed to configure the Web viewer settings in HTTPS mode with Internet Explorer, edit the Internet options as follows: <Menu → Tools → Internet Options → Advanced → Security → Uncheck TLS 1.0, and check TLS 1.1, TLS 1.2>
4. Search for the public certificate that you want to install on the camera. To install the certificate on the camera, you need to provide a certificate name (it can be arbitrarily assigned by the user), certificate file issued from the certification authority and a key file.
  - The **<HTTPS (Secure connection mode using the public certificate)>** item will be active only if there exists a public certificate installed.
5. When done, click **[Apply (  )]**.



### Installing the certificate

1. Enter the certificate name.
2. Click the **[Browse (  )]** button, select the public certificate file and key file to be installed, and then click the **[Install (  )]** button.


### Deleting the certificate

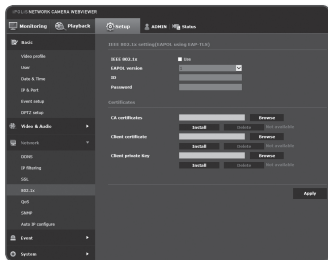
1. Click **[Delete (  )]** button.
2. To delete a public certificate, you should access the network video decoder in the mode of **<HTTP (Do not use secure connection)>** or **<HTTPS (Secure connection mode using a unique certificate)>**.


# setup screen


## 802.1x

When connecting network, you can choose whether using 802.1x protocol, and then install the certification.




1. From the Setup menu, select the <Network (  )> tab.
2. Click <802.1x>.
3. Set the <IEEE 802.1x setting(EAPOL using EAP-TLS)>.
  - IEEE 802.1x : Specify the use of the 802.1x protocol.
  - EAPOL version : Select version 1 or 2.
  - ID : Enter the client certificate ID.
  - Password : Enter the client private key password. If the key file used is not encrypted, you don't need to enter it.



-  If the connected network device does not support the 802.1x protocol, the protocol will not operate properly even if you set it.

4. Install/remove the certificate.
  - CA certificates : Select a public certificate that contains the public key.
  - Client certificate : Select a public certificate that contains the client certificate key.
  - Client private Key : Select a public certificate that contains the client private key.
5. When done, click [Apply (  )].





### To install/remove 802.1x related certificates

1. Press the [Browse (  )] button for each item and select a certificate to install.
2. If no certificate is installed, you will see "Not Available" appearing next to the selected item.
3. Press the [Install (  )] button to start installation with a message of "Installed" next to the item.
4. Press the [Delete (  )] button to remove the certificate.



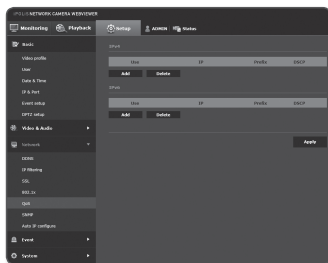
## QoS

You can specify the priority to secure a stable transfer rate for a specific IP.

1. From the Setup menu, select the **<Network (  >** tab.
2. Click **<QoS>**.
3. Click the **[Add (  )]** button.  
The IP list will be created.
4. Enter an IP address to which you will apply QoS.
5. Select an IP to delete from the list.  
Click the **[Delete (  )]** button.
6. When done, click **[Apply (  )]**.




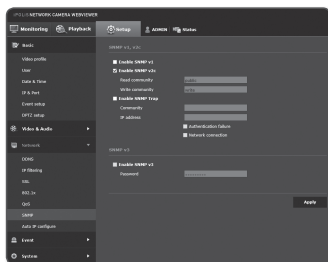
- The default prefix for IPv4 is 32;  
For DSCP, the default is set to 63.
- Only the IP addresses that are set to **<Use>** can be prioritized.



## SNMP

With the SNMP protocols, the system or network admin can monitor the network devices on a remote site, and configure the environment settings.

1. From the Setup menu, select the **<Network (  >** tab.
2. Click **<SNMP>**.
3. Specify the **<SNMP>**.
  - Enable SNMP v1 : SNMP version 1 will be active.
  - Enable SNMP v2c : SNMP version 2 will be active.
    - Read community : Provide the name of the read community where you can access to the SNMP information.  
The default name is **<public>**.
    - Write community : Provide the name of the write community where you can access to the SNMP information. The default name is **<write>**.



# setup screen

---

- Enable SNMP Trap : SNMP trap is used to send important events and conditions to the Admin.
  - Community : Enter the trap community name to receive messages.
  - IP address : Enter the IP address to which messages will be sent.
  - Authentication failure : It specifies whether an event shall be generated when the community information is invalid.
  - Network connection : It specifies whether an event shall be generated when the network disconnection is restored.
- Enable SNMP v3 : SNMP version 3 will be active.
  - Password : Specify the default password for SNMP version 3. The default password is <admin4321>.
    - The default password can be exposed to a hacking thread so it is recommended to change the password after installing the product.  
Note that the security and other related issues caused by the unchanged password shall be responsible for the user.
    - Password should be longer than 8 characters, no more than 16 characters.

4. When done, click **[Apply ( **

- SNMP v3 is only able to be set when the secure connection mode is HTTPS.  
Refer to "SSL". (page 83)

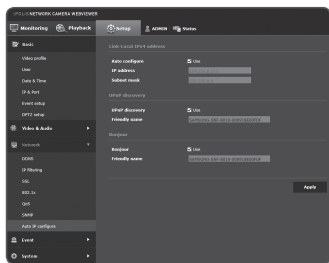
## Auto IP configure

You can set the IP available for access and camera searching automatically.

1. From the Setup menu, select the <Network (  )> tab.
2. Click <Auto IP configure>.
3. Set the <Link-Local IPv4 address>.

An additional IP address may be assigned to access the camera from the Link-Local network.

- Auto configure : It specifies Able or Disable for the Link-Local IPv4 address.
- IP address : Display the assigned IP address.
- Subnet mask : Display the subnet mask of the assigned IP.



4. Set the <UPnP discovery>.

Cameras can be automatically searched in the client and operating system in support of the UPnP protocol.

- UPnP discovery : It specifies Able or Disable for UPnP Discovery.
- Friendly name : Display the camera name.  
Friendly name is displayed in the format of SAMSUNG-<Model Name>-<MAC Address>.



- In the Windows operating system which basically supports UPnP, the cameras connected to the network are displayed.

5. Set the <Bonjour>.

Cameras can be automatically searched in the client and operating system in support of the Bonjour protocol.

- Bonjour : It specifies Able or Disable for Bonjour.
- Friendly name : Display the camera name.  
Friendly name is displayed in the format of SAMSUNG-<Model Name>-<MAC Address>.



- In the Mac operating system, which support Bonjour by default, the connected cameras are automatically displayed in the Bonjour bookmark of the Safari web browser.  
If the Bonjour bookmark is not displayed, check Bookmarks Setup in the "Preference" menu.


6. When done, click [Apply (  )].

# setup screen

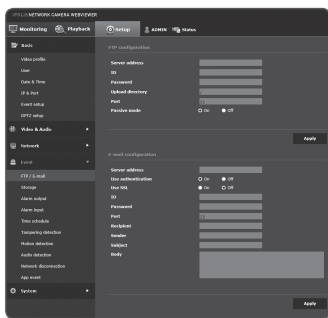
## EVENT SETUP

### FTP / E-mail

You can configure the FTP/E-mail server settings so that you can transfer the images taken with camera to your PC if an event occurs.

1. From the Setup menu, select the **<Event (  )>** tab.
2. Click **<FTP / E-mail>**.
3. Select **<FTP configuration>** or **<E-mail configuration>** and enter / select a desired value.

- FTP configuration
  - Server address : Enter the IP address of the FTP server that you transfer the alarm or event images to.
  - ID : Enter the user ID with which you will log in to the FTP server.
  - Password : Enter the user account password for logging into the FTP server.
  - Upload directory : Specify the FTP path where you will transfer the alarm or event images.
  - Port : The default port of the FTP server is 21; however, you can use a different port number according to the FTP server settings.
  - Passive mode : Select **<On>** if you need to connect in passive mode due to the firewall or the FTP server settings.






# setup screen

---

## To make recording on the Micro SD memory

1. Check the memory card's <Free size> and <Total size>.
  2. Otherwise, check the stored data and if you find them not important, then click <Format> to format the Micro SD memory.
    - Some frames may be skipped if the Micro SD memory card operates at the lower speed than recommended.  
For more details, refer to "**Recommended Micro SD/SDHC/SDXC Memory Card Specifications**".  
(Page 10)
    - For a Micro SD memory card with a large capacity, the formatting will be slowed down accordingly.
    - The data traffic will increase when the camera is set to higher resolution, higher bit rate, and/or higher framerate.  
If there is too much data traffic, some frame may be skipped although it is stored in a full frame.
    - When a frame skip occurs, images are saved at the rate of min. one image per sec.
  3. Specify the storage action.
    - Record profile : Shows recording profile's codec type.
    - Normal : Make recording at a certain frame rate.
    - Event : Set the recording type for a certain event that occurs.
    - Pre event duration : Specify the time point before the occurrence of the alarm; starting from the time point, the images will be transferred. You can specify up to 5 seconds before the occurrence of the alarm.
    - Post event duration : Specify the time point after the occurrence of the alarm; to the specified time point, the images will be transferred. You can specify up to 120 seconds after the occurrence of the alarm.
    - Record file type : It specifies the file format of the recorded images.  
If you insert a Micro SD card saved in another saving file type (AVI/STW), you will need to format it before use.
      - STW : It is Samsung Techwin's unique file format.
      - AVI : It is the conventional avi format.
    - Overwrite : If the Micro SD memory is full, this will delete old data and store new data in replacement.
    - Auto delete : Data for a certain period is deleted, while other data is not deleted.  
This can be set within the range of one day to 180 days.
-  ■ If the storage period is expired, data is automatically deleted and new data will be recorded. Once deleted, it cannot be recovered.

4. Specify the **<Normal record setup>**.

- Always : Always save recorded video in the Micro SD memory card.
  - If set to Always, the activation time cannot be changed.
- Only scheduled time : Records only on the specified time of the specified day of week.
- [Clear ( **Clear** )] : Reset all settings.

5. When done, click **[Apply ( **Apply** )]**.

**If you want to record in your NAS**

1. Set the saving operation and basic recording.

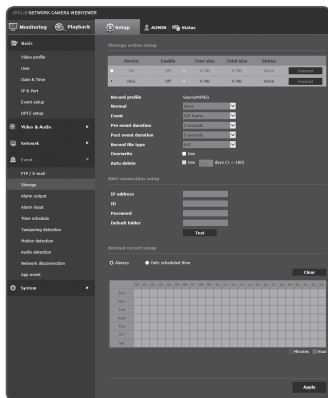
- ! ■ Auto deletion is supported only if your NAS meets the recommended specifications.

2. Enter the information registered in your NAS.

- IP address : Unique IP address assigned to the NAS.
- ID : An ID registered in the NAS.
- Password : Password registered in the NAS.
- Default folder : Designate the NAS user folder to save data in.


3. Click the **[Test]** button to see if you can successfully connect to the NAS.

- ! ■ If the success message is displayed, it means that you can successfully save data in the NAS.
- If the fail message is displayed, check the following.
- Confirm that the IP address of the NAS is valid.
  - Confirm that the ID/password of the NAS is valid.
  - Confirm that you can access the folder designated as the default folder using the ID of the NAS.
  - Confirm that the NAS SMB/CIFS items are unchecked.



# setup screen

---

- Confirm that the NAS IP address and the camera IP address are in the same format.  
ex) The NAS & camera subnet mask initial value is 255.255.255.0.  
If the IP address is 192.168.20.32 then the NAS IP address should be in the range of 192.168.20.1~192.168.20.255.
  - Check whether you tried to access as another user without formatting the default folder saved or used.
  - Confirm that you used recommended NAS equipment.
4. Once the setting is complete, change the setting of the NAS from **<Off>** to **<On>** and click the **[Apply (  )]** button.
  5. Access the NAS to check the available capacity and the total capacity.
  6. If the capacity is insufficient, check the data and click the **[Format]** button to format the NAS on your own.
    - Due to network access errors, you might be unable to save the NAS temporarily.
    - The data traffic will increase when the camera is set to higher resolution, higher bit rate, and/or higher framerate.  
If there is too much data traffic, some frame may be skipped although it is stored in a full frame.
    - When a frame skip occurs, images are saved at the rate of min. one image per sec.

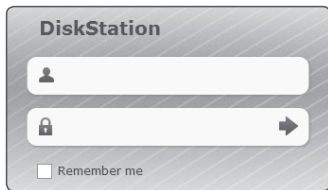


## NAS (Network Attached Storage) guide

- ❗ ■ When you use the NAS, you might be unable to save data due to temporary network disconnections.
- If the setting allows a Micro SD memory card and the NAS to be simultaneously connected for use, the higher priority for recording goes to the NAS.
- If you activate Overwrite to the NAS by setting it to <On> and the available capacity is below 1%, it will be saved in the Micro SD card.
- If you are saving data in the NAS, you might be unable to save it when you insert a Micro SD memory card used by another camera.
- NAS recommended specs : Refer to “**NAS recommended specs**”. (Page 11)
- If you change the NAS saving while saving data in the NAS, it will not be reflected in the system immediately.
- If you remove NAS equipment on your own while saving data, or if the network is disconnected, NAS saving operation will be terminated abnormally.
- As a rule of thumb, you are recommended to use one NAS sharing directory per camera without duplicated use.

The following is a description of how to save data using the NAS according to the Synology NAS method, which is one of the recommended products.

1. Access the Synology NAS as an admin.  
In this example, the NAS IP Address is set to [192.168.20.253].

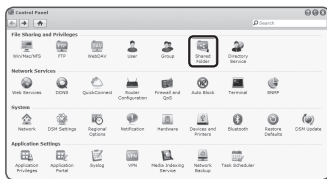


2. If you access it as an admin, the following screen will be displayed. Click the [Control Panel].

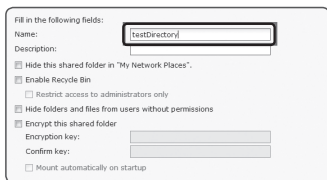


# setup screen

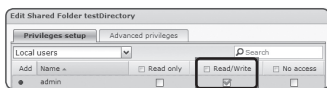
- Click the **<Shared Folder>** in the file sharing and privilege menu.



- Click the **[Create]** button.
- After entering the shared folder name(ID), click the **[OK]** button to create a shared folder.  
In this example, the shared folder name is **[testDirectory]**.



- In Windows, for NAS access, set the privilege for the shared folder as follows.  
Check the admin's **[Read/Write]**.



- Click on the **<User>** in the file sharing and privilege menu.



8. After clicking the **[Create]** button, enter name(ID) and password.

In this example, name(ID) is set to **[testID]** and password is also set to **[testID]**.



- According to the NAS recommendations, when you use Netgear's NAS equipment, do not allocate the capacity for use.

9. In Windows, set the privilege for NAS access.

For the shared folder created in step 4 called “testDirectory” check **[Read/Write]**.

10. Basic setting in the NAS is completed. Connect your camera to the actual NAS.

As shown below, enter the NAS connection setting items.



11. After entering item 10, check <On>.

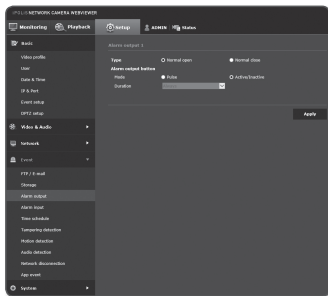
12. Click the **[Apply (Apply)]** button. Finish saving by using the NAS.

Device	Enable	Free size	Total size	Status	Format
SD	Off	0 MB	0 MB	None	Format
NAS	On	799286 MB	934349 MB	Recording	Format

# setup screen

## Alarm output

1. From the Setup menu, select the <Event (  )> tab.
2. Click <Alarm output>.
3. Set the camera's type of alarm output.
  - If you change the alarm output type, the alarm out button on the monitoring page and alarm output type displayed on Event Setup page will be changed accordingly.
  - Type
    - Normal open : Considers "Open circuit" status of the sensor or alarm input device as normal, and triggers alarm event if becomes "Closed circuit" status.
    - Normal close : Considers "Closed circuit" status of the sensor or alarm input device as normal, and triggers alarm event if becomes "Open circuit" status.
4. Set the alarm output button.
  - Mode : Sets the alarm output method.
    - There is difference between operations when clicked alarm output button while disabled.
    - Pulse : It is activated during the time period specified by the duration (switching interval) and then becomes inactive automatically.
    - Active/Inactive : It maintains as activated until the user clicks the button again to make it inactive.
  - Duration : Set the alarm duration that maintains activated if the mode is set to pulse, from 1 to 15 seconds.
5. When done, click [Apply (  )].



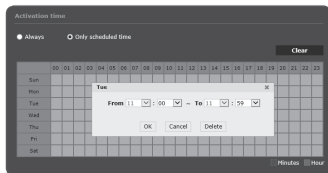
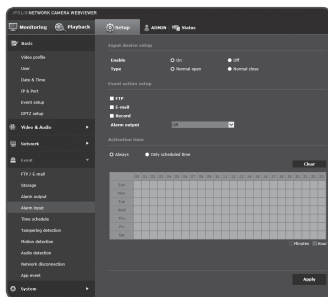
## Alarm input

You can set the alarm input type, activation time, and operation mode.

1. From the Setup menu, select the **<Event (🔔)>** tab.
2. Click **<Alarm input>**.
3. Set whether or not to **<Enable>**.
4. Select the type.
  - Normal open : It is normally open, but if it is closed, an alarm will be triggered.
  - Normal close : It is normally closed, but if it is open, an alarm will be triggered.
5. Specify the **<Activation time>**.
  - Always : Always check if an alarm occurs. It activates in operated mode when the alarm occurs.
    - If set to **<Always>**, the activation time cannot be changed.
  - Only scheduled time : Check if an alarm occurs at a specified day of the week for a specified time period. It activates in operated mode when the alarm occurs.
  - [Clear (🗑️)] : Reset all settings.
  - Minute : Click an area in Activation Time and set the time by minutes.
  - Hour : Drag your mouse at Activation Time and set the time by hours.




- The transfer interval setting value must be smaller than the preset activation interval to succeed in image transmission.



# setup screen

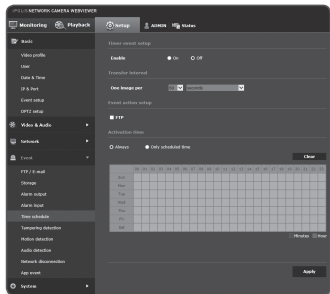
---

6. Specify an operation that will perform if an alarm occurs.
  - FTP : Specify the use of FTP transfer in the alarm input setup.
    - Refer to "**FTP / E-mail**" for more details. (page 88)
  - E-mail : Specify the use of email transfer in the alarm input setup.
    - Refer to "**FTP / E-mail**" for more details. (page 88)
  - Record : Specify the use of recording in the alarm input setup.
    - Set <**Record**> to <**On**> in <**Storage**>. (page 89)
  - Alarm output : Select whether to set the alarm output if an alarm is incoming, and specify the alarm output time.
7. When done, click [**Apply** (  )].

## Time schedule

You can set to save the video data at a certain interval as scheduled regardless of the actual occurrence of the event.

1. From the Setup menu, select the <Event (📹)> tab.
2. Click <Time schedule>.
3. Set whether or not to <Enable>.
4. Specify the <Transfer interval>.
5. Specify the <Activation time>.
  - Always : Always activates in operated mode at the set interval.
  - Only scheduled time : Periodically activates in operated mode at a specified time and date.
6. Specify the activation conditions.
  - FTP : Specify the use of the FTP transfer if an event occurs.
    - Refer to "FTP / E-mail" for more details. (page 88)
7. When done, click [Apply (Apply)].

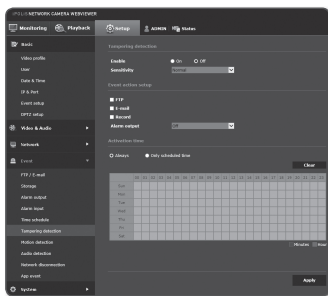


# setup screen

## Tampering detection

You can set to detect tampering attempts and trigger events, such as sudden change of camera's framing direction, blocked lens and other overall change of scenes from the video.

1. From the Setup menu, select the **<Event (📁)>** tab.
2. Click **<Tampering detection>**.
3. Set whether or not to **<Enable>**.
4. Set the tampering detection sensitivity.  
The higher the sensitivity, detects the minutest tampering attempts.
5. Specify the activation time and activation condition.
  - For more information about **<Activation time>** and **<Action>**, refer to "Alarm input". (page 97)
6. When done, click **[Apply (📁)]**.



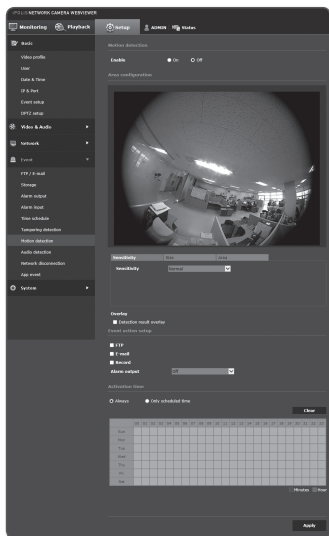
- **!** Tampering detection works based on state of the Source View screen of **<Video profile>**. When tampering appears in the Source View screen, the alarm goes off, even if no tampering occurs in the Dewarp view.
- The default tampering detection function may not work properly in the following cases:
  - Under circumstances of simple background or low illumination and night time may lower the detection sensitivity.
  - A severe shaking of the camera or a drastic change to the illumination can be considered a tampering by mistake.
  - Detection of the tampering may take some time (maximum 5 seconds) right after the tampering was made.
  - Once a tampering is detected, the camera will resume a normal operating after a certain stability time (approx. 5 seconds) during which no detection will be performed.



## Motion detection

Events of motion detection can be set to trigger event signal output.

1. From the Setup menu, select the **<Event (🔔)>** tab.
2. Click **<Motion detection>**.
3. Set whether or not to **<Enable>**.
4. Set **<Sensitivity>**, **<Size>** and **<Area>**.
5. Set whether to use **<Detection result overlay>**.  
When a motion is detected, its size and position is marked with a rectangle on the screen.
  - Green : All targets detected as moving.
6. Specify the activation time and activation condition.
  - For more information about **<Activation time>** and **<Action>**, refer to "Alarm input". (page 97)
7. When done, click **[Apply (Apply)]**.



# setup screen

---



- Motion detection works based on state of the Source View screen of <Video profile>. When a motion appears in the Source View screen, the alarm goes off, even if no motion occurs in the Dewarp view.
- Before using, set the minimum and maximum motion sizes to suit desired motion range to be detected.
- Detected size of an object may have difference with the actual size according to its shape.
- Up to 16 objects from the top side of the screen can be displayed.
- In the following cases, effective functioning of motion detection may be degraded or cause improper detection.
  - The object color or brightness is similar to the background.
  - Small activities around the border area of the camera's field of view.
  - Multiple movements continue occurring at random due to a scene change, rapid lighting changes or other reasons.
  - A fixed object continues moving in the same position.
  - Motions of less position changing such as approaching to the camera or fading away from the camera.
  - Moving object approaches to the camera too close
  - An object hides other objects behind.
  - Two or more objects overlap or one object divides in multiple portions.
  - Too fast object (for a proper detection, one object should be found overlapping between contiguous frames).
  - Reflection / blur / shadow due to a strong light such as direct sunlight, illumination, or headlamp.
  - In severe snow, rain, wind or in dawn / dusk.

### To use Motion detection

It detects a motion that meets all conditions specified by sensitivity, size and area.

1. Select **<Sensitivity>** tab to set the sensitivity level. You can set the sensor's sensitivity to detect a motion out of the background from the monitoring video.



- In a situation that definitely distinguishes objects out of backgrounds, set this to a low sensitivity level. For opposite case that is hard to distinguish objects like low illuminated situation, set this to a high level.

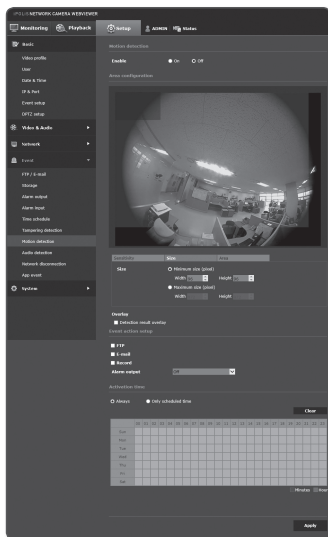
2. Select **<Size>** tab.

You can limit the minimum/maximum size of motion to be detected.

- **Minimum size** : To set the minimum size of detected motions, select **<Minimum size>** and then point and drag to the desired size on the screen using the mouse.
- **Maximum size** : To set the maximum size of detected motions, select **<Maximum size>** and then point and drag to the desired size on the screen with your mouse.



- Motions smaller than the specified minimum size or bigger than the maximum size are not detected. To avoid unintended detections caused by great and small noises, set minimum/maximum motion sizes appropriately in accordance to your environments.  
Note that same motions on the same location can be differently detected in their detection size; it is recommended to consider and include the tolerable difference when setting the minimum/maximum detection sizes.



# setup screen

## 3. Select <Area> tab.

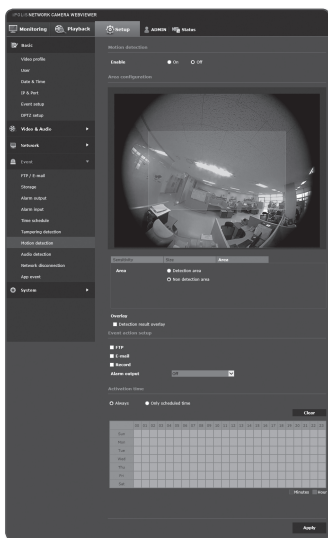
You can specify an area on the screen to include or exclude the area to/from detection.

You can specify up to 4 areas.

- Detection area : Sets the entire screen as excluded from detection, and adds specified area as motion detection area. Set an area to be detected by dragging your mouse on the screen.
- Non detection area : Sets the entire screen as motion detection area, and excludes specified area as not to be detected. Set an area not to be detected by dragging your mouse on the screen.

## 4. To delete an area, right click on the screen to open popup context menu and select Delete, and [OK] button.

## 5. When done, click [Apply ( )].



## Audio detection

You can set to detect sound over the specified level and trigger an event accordingly.

1. From the Setup menu, select the **<Event (🔔)>** tab.
2. Click **<Audio detection>**.
3. Set whether or not to **<Enable>**.
4. Set the audio detection's sound level.  
The lower the level, the smaller the sound change is detected.

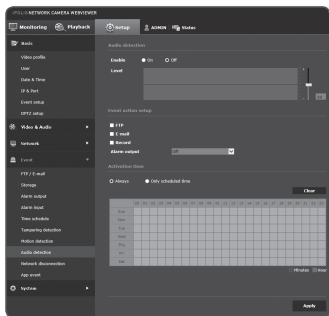


- The audio detection level is designed to normalize the input data to a value between 1 and 100 and detect the signal larger than threshold level. It is unrelated to the decibel (dB) level.

5. Specify the activation time and activation condition.
  - For more information about **<Activation time>** and **<Action>**, refer to "Alarm input". (page 97)
6. When done, click **[Apply (Apply)]**.



- Select **<Video & Audio>** - **<Audio setup>** and set the proper volume for your MIC as an audio input source, so that the audio detection function can work properly.
- If detected audio level is too low, set the audio input gain to a higher level in **<Audio setup>**.
- You can use the audio detection function when the camera is connected with an audio input device.

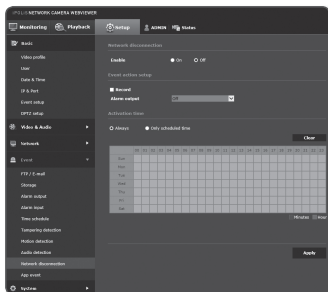


# setup screen

## Network disconnection

When the network is physically disconnected, it is considered as an event to be saved.

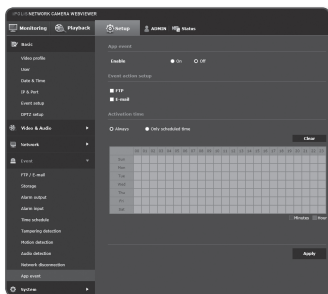
1. From the Setup menu, select the **<Event (📅)>** tab.
2. Click **<Network disconnection>**.
3. Set whether or not to **<Enable>**.
4. Specify the activation time and activation condition.
  - For more information about **<Activation time>** and **<Action>**, refer to "Alarm input". (page 97)
5. When done, click **[Apply (Apply)]**.



## App event


You can set the system to generate signals for the events defined on the application. The event signals provided vary depending on the application function.

1. From the Setup menu, select the **<Event (📅)>** tab.
2. Click **<App event>**.
3. Set whether or not to **<Enable>**.
4. Specify the activation time and activation condition.
  - For more information about **<Activation time>** and **<Action>**, refer to "Alarm input". (page 97)
5. When done, click **[Apply (Apply)]**.



# SYSTEM SETUP

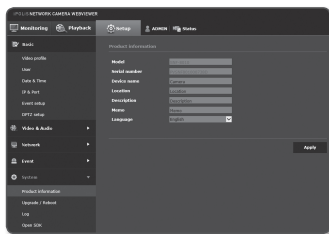
## Product information

1. From the Setup menu, select the **<System (  )>** tab.
2. Click **<Product information>**.
3. Check the camera information, or provide details according to your network environment.
  - Model : Model name of the product.
  - Serial number : Product serial number.
  - Device name : Provide a device name that will be displayed on the Live screen.
  - Location : Specify the location where the camera is installed.
  - Description : Provide detailed information about the camera location.
  - Memo : Provide an explanation about the camera for better understanding.
  - Language : Select a preferred language for the Web Viewer OSD.




- The default language is set to **<English>**.

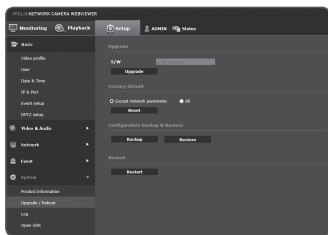
4. When done, click **[Apply (  )]**.



# setup screen

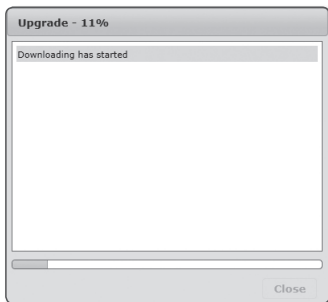
## Upgrade / Reboot

1. From the Setup menu, select the <System (  )> tab.
2. Click <Upgrade / Reboot>.
3. Select a desired item and set it appropriately.
  - Upgrade : Performs upgrading the system.
  - Factory default : Resets the system to the factory default.
    - Except network parameter : Reset the other settings except for Network settings.
    - All : Resets all settings including the camera settings. (however, the log information will not be reset)
      - The IP addressing system will be defaulted to DHCP if you reset the camera. If no DHCP server is found, the previous settings will be restored automatically.
  - Configuration backup & Restore : Backs up the current system settings before performing the restoration process. The system is automatically restarts after backup or restoration.
  - Restart : Restarts the system.



## To perform the upgrade

1. Click [Upgrade].
2. Click [Browse] and specify a file to upgrade.
3. Click [Send].
4. The "Upgrade" dialog appears where the progression will be shown in the bottom.
5. Once completed upgrading, the browser exits and the camera restarts.



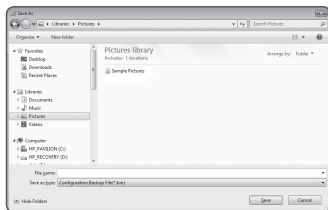




- It may take a max of 10 minutes for the upgrade process.  
If you forcibly terminate the upgrade process, upgrade will not be completed properly.
- During restarting the system, accessing with web viewer will not be made.
- You can download the latest version from the Samsung web site ([www.samsungcctv.com](http://www.samsungcctv.com)).

## To back up the current settings

1. Click [**Backup**].  
The Save As dialog should appear.
2. Specify the backup path with a proper file name, and click [**Save**].  
The backup file will be saved to the specified path in the format of **“.bin”**.

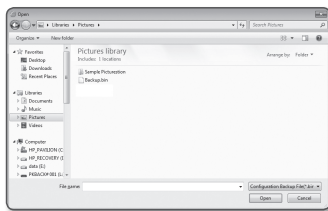


## To restore the backup settings

1. To restore the backup settings, click [**Restore**].
2. Select a backup file and click [**Open**].



- If you perform the backup or restoration, the web browser will be closed and the camera will reboot.
- You can restore a backup file for the SNF-8010/SNF-8010VM model only.



# setup screen

## Log

You can check the system log or event log.

1. From the Setup menu, select the <System (  )> tab.

2. Click <Log>.

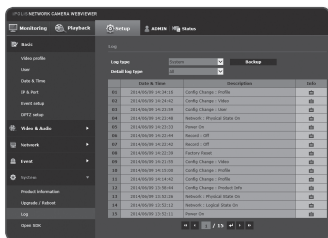
3. Select a log type.

- System : You can check the system logs where any system changes are recorded including the time information.
- Event : You can check the event logs including the time information.

4. From the right log list, select an item to search for.

- If you select <All> in the top left dropdown list, all logs for the applicable log type will be displayed.




5. If one page can not display all the logs available, use the bottom buttons to move to the previous, next, or the last item.

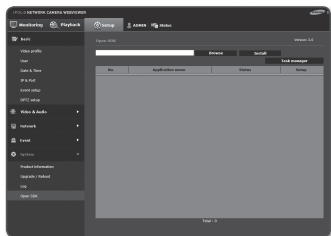


- If you want to view the details of a log, click [Info (  )] in the right column of the log; the log information will be shown in the bottom pane.
- Each page displays 15 logs with the latest one displayed at the top.
- The event/system log list can contain up to 1000 logs; after that, the existing logs will be deleted from the oldest one each time a new log is created.

## Open SDK

A user can install an application on their camera to execute additional functions.

1. From the Setup menu, select the **<System (  >** tab.
2. Click **<Open SDK>**.
3. Click the **[Browse (  )]** button to select the \*.cap file from the user folder.
4. Click the **[Install (  )]** button to install your application.
5. The information of the installed application is displayed in the list.



- Uninstall : Deletes installed or operating applications.
- Go App : Move to the web page of each application.
- Start : Execute an installed application.
- Stop : Terminates a running application.
- Health : Displays the currently running application's resource occupation rate, thread counts and execution time, etc.
- Priority : Sets the priority of running applications.  
If the total resource utilization rate of the camera (including main tasks and applications) exceeds 80%, an ongoing application will be forced to stop. In this case, the priority set by the user is used to determine which application should be stopped first.
- Auto start : When the camera's power supply or main task is running, a certain application for which auto execution has been activated will run automatically.
- Task manager : This displays the resource occupation rate of an application currently running in your camera.
  - Memory Usage (%) : This is the memory utilization rate for each application.
  - CPU Usage (%) : This is the CPU utilization rate for each application.
  - Thread count : This is the number of threads created by each application.
  - Duration : This is the total execution time of each application.
  - Kill Task : Terminates an application.
  - Total Usage : This is the total resource occupation rate of the camera (including main tasks and applications).




- For questions about application use or installation, check the Techwin developer website.

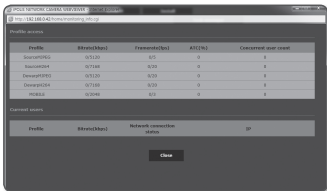
## VIEWING PROFILE INFORMATION

### Profile access

You can check the profile information.

1. Click [**Status** (  )] on the live screen.
2. The profile information screen is displayed.

- Profile access : Show the information of the newly added profile.
  - Profile : Show the information of the newly added codec.
  - Bitrate(kbps) : Show both the actual bit rate and the set bit rate.
  - Framerate(fps) : Show both the actual frame rate and the set frame rate.
  - ATC(%) : Show the ATC status.
  - Concurrent users count : Show the number of concurrent users who access the profile.
- Current users : Shows information on users accessing web viewer and displaying monitoring video.
  - Profile : Show the name of the profile accessed by the user.
  - Bitrate(kbps) : Show the current bit rate.
  - Network connection status : It shows whether the network is working fine.
  - IP : Show the IP address of the current user.



- To check information on the profile currently used, click [**Status** (  )] again to refresh it. It takes a certain time for any changes to be applied.
- If many viewers see <Source View> and <Dewarp View> at the same time, frame rate may fall below normal rates.

## SPECIFICATION

Items		Description	
		SNF-8010	SNF-8010VM
Video	Imaging Device	1/1.8" 6M PS CMOS (IMX178)	
	Total Pixels	6M	
	Effective Pixels	2560X2048 (5.2M)	
	Scanning System	Progressive	
	Min. Illumination	Color : 0.5 Lux (F2.5, 50IRE) Color : 0.2 Lux (F2.5, 30IRE) B/W : 0.05 Lux (F2.5, 50IRE) B/W : 0.02 Lux (F2.5, 30IRE)	
	S / N Ratio	-	
	Video Out	-	
Lens	Focal Length (Zoom Ratio)	1.14mm (Fixed)	
	Max. Aperture Ratio	F2.5	
	Angular Field of View	H : 187°, V : 187°, D : 187°	
	Min. Object Distance	0.3m ~ Infinity	
	Focus Control	Manual	
	Lens Type	Fixed Lens	
	Mount Type	Board Type (M12)	

# appendix

Items		Description	
		SNF-8010	SNF-8010VM
Operational	Camera Title	Displayed up to 15 characters	
	Day & Night	Auto/Color/B/W	
	Backlight Compensation	BLC	
	Wide Dynamic Range	60dB	
	Contrast Enhancement	SSDR (Samsung Super Dynamic Range) (Off / On)	
	Digital Noise Reduction	DNR (2D+3D Noise Filter), Function Name : SSNR	
	Digital Image Stabilization	-	
	Defog	-	
	Motion Detection	Off / On (4ea Rectangle zones)	
	Privacy Masking	Off / On (32 Zones with Rectangle)	
	Gain Control	Off / Low / Medium / High	
	White Balance	ATW / AWC / Manual / Indoor / Outdoor(Included Mercury)	
	Electronic Shutter Speed	2 ~ 1/12,000sec	
	Digital Zoom	16x, Digital PTZ (Preset, Group)	
	Flip / Mirror	Off / On	
	Intelligent Video Analytics	Tampering, Audio Detection	
	Alarm I/O	Input 1ea / Output 1ea	

Items		Description	
		SNF-8010	SNF-8010VM
Operational	Audio In	Selectable (Mic IN/Line IN) Supply voltage: 2.5VDC(4mA), Input impedance: approx. 2K Ohm	
	Audio out	Line out (3.5mm stereo mini jack Max output Level : 1Vrms	Line out (3.5mm stereo mini jack
	Alarm Triggers	Motion detection, Tampering, Audio Detection, Alarm Input, Network Disconnection	
	Alarm events	<ul style="list-style-type: none"> <li>• File upload via FTP and E-Mail</li> <li>• Notification via E-Mail, TCP and HTTP</li> <li>• Local storage(SD/SDHC/SDXC) recording at Network disconnected &amp; Event (Alarm Triggers)</li> <li>• External output</li> </ul>	
	View Composition	Camera : 360 view, Single Panorama, Double Panorama, Quad view, Single Rectangle,  CMS : 360 view, Single Panorama, Double Panorama, Quad view, Single Rectangle, 360 + 3Rectangle, Single Panorama + 2Rectangle	
Network	Ethernet	RJ-45 (10/100BASE-T) : Female Type	M12 Connector Type
	Video Compression Format	H.264 (MPEG-4 Part 10/AVC), Motion JPEG	

Items		Description	
		SNF-8010	SNF-8010VM
Network	Resolution	<5.2M Original> 2560x2048, 1920x1080, 1600x1200, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 720x480 640x480, 320x240	
	Resolution (Dewarped View)	1. Single Rectangle 800x600, 640x480, 320x240  2. Quad View 1600x1200, 1280x960, 1024x768, 800x600, 640x480, 320x240  3. Double Panorama 2048x1536, 1600x1200, 1280x960, 1024x768, 800x600, 640x480, 320x240  4. Single Panorama 2048x768, 1600x600, 1280x480, 1024x384, 800x300, 640x240, 320x120	
	Max. Framerate	* MJPEG - Source View: 2560x2048 : 10fps 1920x1080 / 1600x1200 / 1280x1024 / 1280x960 / 1280x720 / 1024x768 : 15fps 800x600 / 720x480 / 640x480 / 320x240 : 20fps - Single Panorama View 2048x768 / 1600x1200 / 1280x480 / 1024x384 : 15fps 800x300 / 640x240 / 320x120 : 20fps - Double Panorama View 2048x1536 / 1600x1200 / 1280x960 / 1024x768 : 15fps 800x600 / 640x480 / 320x240 : 20fps - Quad View 1600x1200 / 1280x960 / 1024x768 : 15fps 800x600 / 640x480 / 320x240 : 20fps - Single Rectangle View 800x600 / 640x480 / 320x240 : 20fps	



Items		Description	
		SNF-8010	SNF-8010VM
Network	Max. Framerate	* Under Default Profile Setting - Dual Video Stream framerate SourceH264(2560x2048) : 15fps DewarPH264(2048x1536)@Ceiling/Ground, Dual Panorama : 10fps SourceH264(2560x2048) : 19fps DewarPH264(1600x1200)@Ceiling/Ground, Quad View : 20fps SourceH264(2560x2048) : 19fps DewarPH264(800x600)@Ceiling/Ground, Single Rectangle : 18fps SourceH264(2560x2048) : 17fps DewarPH264(2048*768)@Wall, Single Panorama : 13fps	
	Video Quality Adjustment	H.264 : Target Bitrate Level Control MJPEG : Quality Level Control	
	Bitrate Control Method	H.264 : CBR or VBR Motion JPEG : VBR	
	Streaming Capability	Multiple streaming (Up to 5 Profiles)	
	Audio Compression Format	G.711 $\mu$ -law /G.726 Selectable G.726 (ADPCM) 8KHz, G.711 8KHz G.726 : 16Kbps, 24Kbps, 32Kbps, 40Kbps	
	Audio Communication	Bi-directional	
	IP	IPv4, IPv6	
	Protocol	TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP, RTSP, NTP, HTTP, HTTPS, SSL, DHCP, PPPoE, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, PIM-SM, UPnP, Bonjour	

# appendix

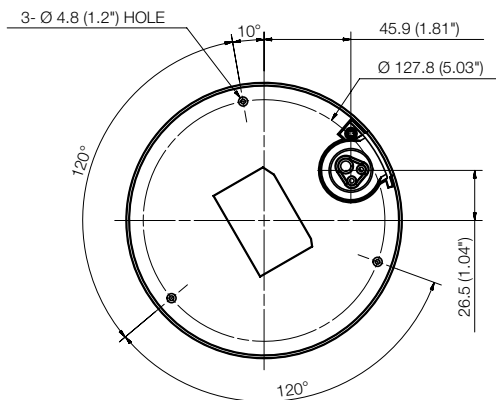
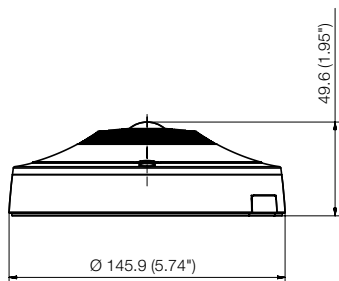
Items		Description	
		SNF-8010	SNF-8010VM
Network	Security	HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access Log 802.1x Authentication	
	Streaming Method	Unicast / Multicast	
	Max. User Access	10 users at Unicast Mode	
	Memory Slot	micro SD/SDHC/SDXC (64GB) - motion Images recorded in the SD/SDHC/SDXC memory card can be downloaded.	
	Application Programming Interface	ONVIF Profile S SUNAPI (HTTP API) v2.0 SVP 1.2	
	Webpage Language	English, French, German, Spanish, Italian, Chinese, Korean, Russian, Japanese, Swedish, Danish, Portuguese, Czech, Polish, Turkish, Rumanian, Serbian, Dutch, Croatian, Hungarian, Greek, Norway, Finland	
	Web Viewer	Supported OS : Windows XP / VISTA / 7 / 8, MAC OS X 10.7 Supported Browser : Microsoft Internet Explorer (Ver. 8~11), Mozilla Firefox (Ver. 9~19), Google Chrome (Ver. 15~25), Apple Safari (Ver. 6.0.2(Mac OS X 10.8, 10.7 only), 5.1.7) * Mac OS X only	
	Central Management Software	SSM, Smart Viewer, I-Polis Mobile Viewer	

Items		Description	
		SNF-8010	SNF-8010VM
Environmental	Operating Temperature / Humidity	-10°C ~ +55°C (+14°F ~ +131°F) / Less than 90% RH	-30°C ~ +55°C (-22°F ~ +131°F) / Less than 90% RH * Start up should be done at above -25°C
	Storage Temperature / Humidity	-30°C ~ +60°C (-22°F ~ +140°F) / Less than 90% RH	
	Ingress Protection	-	IP66
	Vandal Resistance	-	IK10
	Standard Certification	UL, CE, FCC, RoHS, Gost, KC	UL, CE, FCC, RoHS, Gost, KC, EN-61373, EN-50155
Electrical	Input Voltage / Current	DC12V±10%, PoE (IEEE802.3af, Class3)	DC12V±10%, PoE (IEEE802.3af, Class3) mode A only
	Power Consumption	Max 10.3W (PoE, Class3), Max 8.7W (DC 12V)	
Mechanical	Color / Material	IVORY, Aluminum	IVORY, Aluminum (Clear Dome Cover)
	Dimension (Ø x H)	Ø145.9 x H49.6 mm	Ø145.9 x H62.4 mm
	Weight	780g	800g

## PRODUCT OVERVIEW

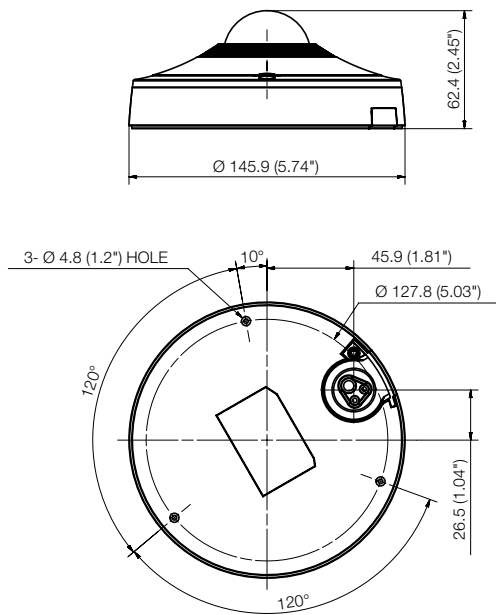
SNF-8010

Unit : mm (inch)



# SNF-8010VM

Unit : mm (inch)



## TROUBLESHOOTING

PROBLEM	SOLUTION
I can't access the camera from a web browser.	<ul style="list-style-type: none"> <li>• Check to make sure that the camera's Network settings are appropriate.</li> <li>• Check to make sure that all network cables have been connected properly.</li> <li>• If connected using DHCP, verify that the camera is able to acquire dynamic IP addresses without any problem.</li> <li>• If the camera is connected to a Broadband Router, verify that port forwarding is properly configured.</li> </ul>
Viewer got disconnected during monitoring.	<ul style="list-style-type: none"> <li>• Connected Viewers become disconnected upon any change to camera or network configurations.</li> <li>• Check all network connections.</li> <li>• If the camera is connected over an PPPoE network, it's possible for Viewer to disconnect under poor network conditions.</li> </ul>
I cannot connect to the system using a tab browser of Internet Explorer 7.0.	<ul style="list-style-type: none"> <li>• An error may be generated when connecting with a new window or tab since the cookie data are shared. Do not use a new window or tab, select "File → New session".</li> </ul>
The camera connected to the network is not detected in the IP installer program.	<ul style="list-style-type: none"> <li>• Turn off the firewall settings on your PC and then search the camera again.</li> </ul>
Images overlap.	<ul style="list-style-type: none"> <li>• Check whether two or more cameras are set to a single multicast address instead of different addresses. If a single address is used for multiple cameras, the images may overlap.</li> </ul>
No image appears.	<ul style="list-style-type: none"> <li>• If the transmission method is set to multicast, check whether there is a router that supports multicast in the LAN the camera is connected to.</li> </ul>

PROBLEM	SOLUTION
<p>&lt;Motion detection&gt; of &lt;Event&gt; is set to &lt;Enable&gt;, but no notification e-mail reaches me even when a motion event had occurred.</p>	<ul style="list-style-type: none"> <li>• Verify the settings in the following sequence:               <ol style="list-style-type: none"> <li>A. Check &lt;Data &amp; Time&gt; settings.</li> <li>B. The &lt;Motion detection&gt; should be set to &lt;Enable&gt;.</li> <li>C. Check if the &lt;E-mail&gt; option of &lt;Event setup&gt; menu is checked to use.</li> </ol> </li> </ul>
<p>No signal is found at the Alarm Output port even when an intelligent video analysis event is generated.</p>	<ul style="list-style-type: none"> <li>• Check alarm output port settings.</li> </ul>
<p>Cannot record into the Micro SD memory card.</p>	<ul style="list-style-type: none"> <li>• Check if the memory card is defective.</li> </ul>
<p>Micro SD memory card is inserted but the camera does not operate properly.</p>	<ul style="list-style-type: none"> <li>• Check if the memory card is inserted in the proper direction. Operation of memory card that is formatted by other devices is not guaranteed with this camera unit</li> <li>• Format the memory card again in &lt;Setup&gt; → &lt;Event&gt; → &lt;Storage&gt; menu.</li> </ul>
<p>Cannot record in the NAS.</p>	<ul style="list-style-type: none"> <li>• Confirm that the information registered in the NAS is correct.</li> </ul>
<p>It reports that NAS setting has failed.</p>	<ul style="list-style-type: none"> <li>• Confirm that the IP address of the NAS is valid.</li> <li>• Confirm that the ID/password of the NAS is valid.</li> <li>• Confirm that you can access the folder designated as the default folder using the ID of the NAS.</li> <li>• Confirm that the NAS SMB/CIFS items are unchecked.</li> <li>• Confirm that the NAS IP address and the camera IP address are in the same format. ex) The NAS &amp; camera subnet mask initial value is 255.255.255.0. If the IP address is 192.168.20.32 then the NAS IP address should be in the range of 192.168.20.1~192.168.20.255.</li> <li>• Check whether you tried to access as another user without formatting the default folder saved or used.</li> <li>• Confirm that you used recommended NAS equipment.</li> </ul>

# OPEN SOURCE LICENSE NOTIFICATION ON THE PRODUCT

---

The software included in this product contains copyrighted software that is licensed under the GPL/LGPL. You may obtain the complete Corresponding Source code from us for a period of three years after our last shipment of this product by sending email to [help.cctv@samsung.com](mailto:help.cctv@samsung.com)

If you want to obtain the complete Corresponding Source code in the physical medium such as CD-ROM, the cost of physically performing source distribution might be charged.

- GPL Software : linux kernel, uboot, Sysvinit, busybox-1.15.3 (<http://www.busybox.net/>), Net-snmp 5.4 (<http://www.net-snmp.org/>), dvzsk 2.10.01.18
- LGPL Software : glibc-2.0 (<http://www.gnu.org/software/libc/>),
- BSD1.0 : math-linux (<http://sourceforge.net/projects/math-linux/>)
- BSD2.0 : lighttpd-1.4.26 (<http://www.lighttpd.net/>), MiniUPnP Project Client (<http://miniupnp.tuxfamily.org/>)
- MIT License : Prototype JavaScript Framework-1.7 (<http://prototypejs.org/>)
- libxml2 License : libxml2 (<http://xmlsoft.org/>)
- OpenSSL License : openssl-0.9.8 (<http://www.openssl.org/>)
- PHP 3.01 License : php-5.3.2 (<http://www.php.net/>)

## GNU GENERAL PUBLIC LICENSE

Version 2, June 1991

Copyright (C)1989, 1991 Free Software Foundation, Inc. 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301, USA

Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

### Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public License is intended to guarantee your freedom to share and change free software-- to make sure the software is free for all its users. This General Public License applies to most of the Free Software Foundation's software and to any other program whose authors commit to using it. (Some other Free Software Foundation software is covered by the GNU Lesser General Public License instead.) You can apply it to your programs, too. When we speak of free software, we are referring to freedom, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish), that you receive source code or can get it if you want it, that you can change the software or use pieces of it in new free programs ; and that you know you can do these things.

To protect your rights, we need to make restrictions that forbid anyone to deny you these rights or to ask you to surrender the rights. These restrictions translate to certain responsibilities for you if you distribute copies of the software, or if you modify it.

For example, if you distribute copies of such a program, whether gratis or for a fee, you must give the recipients all the rights that you have.

You must make sure that they, too, receive or can get the source code. And you must show them these terms so they know their rights. We protect your rights with two steps :

(1)copyright the software, and (2)offer you this license which gives you legal permission to copy, distribute and/or modify the software. Also, for each author's protection and ours, we want to make certain that everyone understands that there is no warranty for this free software. If the software is modified

by someone else and passed on, we want its recipients to know that what they have is not the original, so that any problems introduced by others will not reflect on the original authors' reputations.

Finally, any free program is threatened constantly by software patents. We wish to avoid the danger that redistributors of a free program will individually obtain patent licenses, in effect making the program proprietary. To prevent this, we have made it clear that any patent must be licensed for everyone's free use or not licensed at all. The precise terms and conditions for copying, distribution and modification follow.

## TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

Version 2, June 1991 Copyright (C) 1989, 1991 Free Software Foundation, Inc. 51 Franklin St

0. This License applies to any program or other work which contains a notice placed by the copyright holder saying it may be distributed under the terms of this General Public License.

The "Program", below, refers to any such program or work, and a "work based on the Program" means either the Program or any derivative work under copyright law : that is to say, a work containing the Program or a portion of it, either verbatim or with modifications and/or translated into another language. (Hereinafter, translation is included without limitation in the term "modification".) Each licensee is addressed as "you".

Activities other than copying, distribution and modification are not covered by this License ; they are outside its scope. The act of running the Program is not restricted, and the output from the Program is covered only if its contents constitute a work based on the Program (independent of having been made by running the Program). Whether that is true depends on what the Program does.

1. You may copy and distribute verbatim copies of the Program's source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty ; and give any other recipients of the Program a copy of this License along with the Program.



You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

2. You may modify your copy or copies of the Program or any portion of it, thus forming a work based on the Program, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions :

- a) You must cause the modified files to carry prominent notices stating that you changed the files and the date of any change.
- b) You must cause any work that you distribute or publish, that in whole or in part contains or is derived from the Program or any part thereof, to be licensed as a whole at no charge to all third parties under the terms of this License.
- c) If the modified program normally reads commands interactively when run, you must cause it, when started running for such interactive use in the most ordinary way, to print or display an announcement including an appropriate copyright notice and a notice that there is no warranty (or else, saying that you provide a warranty) and that users may redistribute the program under these conditions, and telling the user how to view a copy of this License. (Exception: if the Program itself is interactive but does not normally print such an announcement, your work based on the Program is not required to print an announcement.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Program, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Program, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you ; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Program. In addition, mere aggregation of another work not based on the Program with the Program (or with a work based on the Program) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may copy and distribute the Program (or a work based on it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you also do one of the following :

- a) Accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange ; or,
- b) Accompany it with a written offer, valid for at least three years, to give any third party, for a charge no more than your cost of physically performing source distribution, a complete machine-readable copy of the corresponding source code, to be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange ; or,
- c) Accompany it with the information you received as to the offer to distribute corresponding source code. (This alternative is allowed only for noncommercial distribution and only if you received the program in object code or executable form with such an offer, in accord with

Subsection b above.) The source code for a work means the preferred form of the work for making modifications to it. For an executable work, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the executable. However, as a special exception, the source code distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable. If distribution of executable or object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place counts as distribution of the source code, even though third parties are not compelled to copy the source along with the object code.

4. You may not copy, modify, sublicense, or distribute the Program except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense or distribute the Program is void, and will automatically terminate your rights under this License.

However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

5. You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Program or its derivative works.

These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Program (or any work based on the Program), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Program or works based on it.

6. Each time you redistribute the Program (or any work based on the Program), the recipient automatically receives a license from the original licensor to copy, distribute or modify the Program subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties to this License.

7. If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Program at all.

For example, if a patent license would not permit royalty-free redistribution of the Program by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Program.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply and the section as a whole is intended to apply in other circumstances. It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system, which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent

application of that system ; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice. This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

8. If the distribution and/or use of the Program is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Program under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.
9. The Free Software Foundation may publish revised and/or new versions of the General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns. Each version is given a distinguishing version number. If the Program specifies a version number of this License which applies to it and "any later version", you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Program does not specify a version number of this License, you may choose any version ever published by the Free Software Foundation.
10. If you wish to incorporate parts of the Program into other free programs whose distribution conditions are different, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation ; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

## NO WARRANTY

11. BECAUSE THE PROGRAM IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE PROGRAM, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE PROGRAM "ASIS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE PROGRAM IS WITH YOU. SHOULD THE PROGRAM PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.
12. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PROGRAM (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE PROGRAM TO OPERATE WITH ANY OTHER PROGRAMS), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

## END OF TERMS AND CONDITIONS

### How to Apply These Terms to Your New Programs

If you develop a new program, and you want it to be of the greatest possible use to the public, the best way to achieve this is to make it free software which everyone can redistribute and change under these terms.

To do so, attach the following notices to the program. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty ; and each file should have at least the "copyright" line and a pointer to where the full notice is found. one line to give the program's name and an idea of what it does.

Copyright (C)yyyy name of author

This program is free software ; you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation ; either version 2 of the License, or (at your option) any later version.

This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY ; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU General Public License for more details.

You should have received a copy of the GNU General Public License along with this program ; if not, write to the Free Software Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301, USA.

Also add information on how to contact you by electronic and paper mail. If the program is interactive, make it output a short notice like this when it starts in an interactive mode :

Gnomovision version 69, Copyright (C) year name of author  
Gnomovision comes with ABSOLUTELY NO WARRANTY ; for details type 'show w'. This is free software, and you are welcome to redistribute it under certain conditions ; type 'show c' for details.

The hypothetical commands 'show w' and 'show c' should show the appropriate parts of the General Public License. Of course, the commands you use may be called something other than 'show w' and 'show c' ; they could even be mouse-clicks or menu items-- whatever suits your program.

You should also get your employer (if you work as a programmer) or your school, if any, to sign a "copyright disclaimer" for the program, if necessary. Here is a sample ; alter the names:

Yoyodyne, Inc., hereby disclaims all copyright interest in the program 'Gnomovision' (which makes passes at compilers) written by James Hacker. signature of Ty Coon, 1 April 1989  
Ty Coon, President of Vice This General Public License does not permit incorporating

your program into proprietary programs. If your program is a subroutine library, you may consider it more useful to permit linking proprietary applications with the library. If this is

Lwihcaetn ysoeu want to do, use the GNU Lesser General Public instead of this License.

## GNU GENERAL PUBLIC LICENSE

Version 3, 29 June 2007

Copyright (C) 2007 Free Software Foundation, Inc. <<http://fsf.org/>>

Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

## Preamble

The GNU General Public License is a free, copyleft license for software and other kinds of works. The licenses for most software and other practical works are designed to take away your freedom to share and change the works. By contrast, the GNU General Public License is intended to guarantee your freedom to share and change all versions of a program--to make sure it remains free software for all its users.

We, the Free Software Foundation, use the GNU General Public License for most of our software; it applies also to any other work released this way by its authors.

You can apply it to your programs, too. When we speak of free software, we are referring to freedom, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for them if you wish), that you receive source code or can get it if you want it, that you can change the software or use pieces of it in new free programs, and that you know you can do these things.

To protect your rights, we need to prevent others from denying you these rights or asking you to surrender the rights. Therefore, you have certain responsibilities if you distribute copies of the software, or if you modify it: responsibilities to respect the freedom of others.

For example, if you distribute copies of such a program, whether gratis or for a fee, you must pass on to the recipients the same freedoms that you received. You must make sure that they, too, receive or can get the source code. And you must show them these terms so they know their rights. Developers that use the GNU GPL protect your rights with two steps: (1) assert copyright on the software, and (2) offer you this License giving you legal permission to copy, distribute and/or modify it. For the developers' and authors' protection, the GPL clearly explains that there is no warranty for this free software. For both users' and authors' sake, the GPL requires that modified versions be marked as changed, so that their problems will not be attributed erroneously to authors of previous versions. Some devices are designed to deny users access to install or run modified versions of the software inside them, although the manufacturer can do so. This is fundamentally incompatible with the aim of protecting users' freedom to change the software. The systematic pattern of such abuse occurs in the area of products for individuals to use, which is precisely where it is most unacceptable. Therefore, we have designed this version of the GPL to prohibit the practice for those products. If such problems arise substantially in other domains, we stand ready to extend this provision to those domains in future versions of the GPL, as needed to protect the freedom of users.

Finally, every program is threatened constantly by software patents. States should not allow patents to restrict development and use of software on general-purpose computers, but in those that do, we wish to avoid the special anger that patents applied to a free program could make it effectively proprietary. To prevent this, the GPL assures that patents cannot be used to render the program non-free. We precise terms and conditions for copying, distribution and modification follow.

## TERMS AND CONDITIONS

### 0. Definitions.

"This License" refers to version 3 of the GNU General Public License.

"Copyright" also means copyright-like laws that apply to other kinds of works, such as semiconductor masks.

"The Program" refers to any copyrightable work licensed under this License. Each licensee is addressed as "you".

"Licensees" and "recipients" may be individuals or organizations.

To "modify" a work means to copy from or adapt all or part of the work in a fashion requiring copyright permission, other than the making of an exact copy. The resulting work is called a "modified version" of the earlier work or a work "based on" the earlier work.

A "covered work" means either the unmodified Program or a work based on the Program.

To "propagate" a work means to do anything with it that, without permission, would make you directly or secondarily liable for infringement under applicable copyright law, except executing it on a computer or modifying a private copy. Propagation includes copying, distribution (with or without modification), making available to the public, and in some countries other activities as well.

To "convey" a work means any kind of propagation that enables other parties to make or receive copies. Mere interaction with a user through a computer network, with no transfer of a copy, is not conveying. An interactive user interface displays "Appropriate Legal Notices" to the extent that it includes a convenient and prominently visible feature that (1) displays an appropriate copyright notice, and (2) tells the user that there is no warranty for the work (except to the extent that warranties are provided), that licensees may convey the work under this License, and how to view a copy of this License. If the interface presents a list of user commands or options, such as a menu, a prominent item in the list meets this criterion.

### 1. Source Code.

The "source code" for a work means the preferred form of the work for making modifications to it. "Object code" means any non-source form of a work.

A "Standard Interface" means an interface that either is an official standard defined by a recognized standards body, or, in the case of interfaces specified for a particular programming language, one that is widely used among developers working in that language.

The "System Libraries" of an executable work include anything, other than the work as a whole, that (a) is included in the normal form of packaging a Major Component, but which is not part of that Major Component, and (b) serves only to enable use of the work with that Major Component, or to implement a Standard Interface for which an implementation is available to the public in source code form. A "Major Component", in this context, means a major essential component (kernel, window system, and so on) of the specific operating system (if any) on which the executable work runs, or a compiler used to produce the work, or an object code interpreter used to run it.

The "Corresponding Source" for a work in object code form means all the source code needed to generate, install, and (for an executable work) run the object code and to modify the work, including scripts to control those activities. However, it does not include the work's System Libraries, or generalpurpose tools or generally available free programs which are used unmodified in performing those activities but which are not part of the work. For example, Corresponding Source includes interface definition files associated with source files for the work, and the source code for shared libraries and dynamically linked subprograms that the work is specifically designed to require, such as by intimate data communication or control flow between those subprograms and other parts of the work.

The Corresponding Source need not include anything that users can regenerate automatically from other parts of the Corresponding Source. The Corresponding Source for a work in source code form is that same work.

## 2. Basic Permissions.

All rights granted under this License are granted for the term of copyright on the Program, and are irrevocable provided the stated conditions are met. This License explicitly affirms your unlimited permission to run the unmodified Program. The output from running a covered work is covered by this License only if the output, given its content, constitutes a covered work. This License acknowledges your rights of fair use or other equivalent, as provided by copyright law.

You may make, run and propagate covered works that you do not convey, without conditions so long as your license otherwise remains in force. You may convey covered works to others for the sole purpose of having them make modifications exclusively for you, or provide you with facilities for running those works, provided that you comply with the terms of this License in conveying all material for which you do not control copyright. Those thus making or running the covered works for you must do so exclusively on your behalf, under your direction and control, on terms that prohibit them from making any copies of your copyrighted material outside their relationship with you. Conveying under any other circumstances is permitted solely under the conditions stated below. Sublicensing is not allowed; section 10 makes it unnecessary.

## 3. Protecting Users' Legal Rights From anti-Circumvention Law.

No covered work shall be deemed part of an effective technological measure under any applicable law fulfilling obligations under article 11 of the WIPO copyright treaty adopted on 20 December 1996, or similar laws prohibiting or restricting circumvention of such measures.

When you convey a covered work, you waive any legal power to forbid circumvention of technological measures to the extent such circumvention is effected by exercising rights under this License with respect to the covered work, and you disclaim any intention to limit operation or modification of the work as a means of enforcing, against the work's users, your or third parties' legal rights to forbid circumvention of technological measures.

## 4. Conveying Verbatim Copies.

You may convey verbatim copies of the Program's source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice; keep intact all notices stating that this License and any non-permissive terms added in accord with section 7 apply to the code; keep intact all notices of the absence of any warranty; and give all recipients a copy of this License along with the Program. You may charge any price or no price for each copy that you convey, and you may offer support or warranty protection for a fee.

## 5. Conveying Modified Source Versions.

You may convey a work based on the Program, or the modifications to produce it from the Program, in the form of source code under the terms of section 4, provided that you also meet all of these conditions:

- a) The work must carry prominent notices stating that you modified it, and giving a relevant date.
- b) The work must carry prominent notices stating that it is released under this License and any conditions added under section 7. This requirement modifies the requirement in section 4 to "keep intact all notices".
- c) You must license the entire work, as a whole, under this License to anyone who comes into possession of a copy. This License will therefore apply, along with any applicable section 7 additional terms, to the whole of the work, and all its parts, regardless of how they are packaged. This License gives no permission to license the work in any other way, but it does not invalidate such permission if you have separately received it.

d) If the work has interactive user interfaces, each must display Appropriate Legal Notices; however, if the Program has interactive interfaces that do not display Appropriate Legal Notices, your work need not make them do so. A compilation of a covered work with other separate and independent works, which are not by their nature extensions of the covered work, and which are not combined with it such as to form a larger program, in or on a volume of a storage or distribution medium, is called an "aggregate" if the compilation and its resulting copyright are not used to limit the access or legal rights of the compilation's users beyond what the individual works permit. Inclusion of a covered work in an aggregate does not cause this License to apply to the other parts of the aggregate.

## 6. Conveying Non-Source Forms.

You may convey a covered work in object code form under the terms of sections 4 and 5, provided that you also convey the machine-readable Corresponding Source under the terms of this License, in one of these ways:

- a) Convey the object code in, or embodied in, a physical product (including a physical distribution medium), accompanied by the Corresponding Source fixed on a durable physical medium customarily used for software interchange.
- b) Convey the object code in, or embodied in, a physical product (including a physical distribution medium), accompanied by a written offer, valid for at least three years and valid for as long as you offer spare parts or customer support for that product model, to give anyone who possesses the object code either (1) a copy of the Corresponding Source for all the software in the product that is covered by this License, on a durable physical medium customarily used for software interchange, for a price no more than your reasonable cost of physically performing this conveying of source, or (2) access to copy the Corresponding Source from a network server at no charge.
- c) Convey individual copies of the object code with a copy of the written offer to provide the corresponding Source. This alternative is allowed only occasionally and noncommercially, and only if you received the object code with such an offer, in accord with subsection 6b.
- d) Convey the object code by offering access from a designated place (gratis or for a charge), and offer equivalent access to the Corresponding Source in the same way through the same place at no further charge. You need not require recipients to copy the Corresponding Source along with the object code. If the place to copy the object code is a network server, the Corresponding Source may be on a different server (operated by you or a third party) that supports equivalent copying facilities, provided you maintain clear directions next to the object code saying where to find the Corresponding Source. Regardless of what server hosts the Corresponding Source, you remain obligated to ensure that it is available for as long as needed to satisfy these requirements.
- e) Convey the object code using peer-to-peer transmission, provided you inform other peers where the object code and Corresponding Source of the work are being offered to the general public at no charge under subsection 6d. A separable portion of the object code, whose source code is excluded from the Corresponding Source as a System Library, need not be included in conveying the object code work. A "User Product" is either (1) a "consumer product", which means any tangible personal property which is normally used for personal, family, or household purposes, or (2) anything designed or sold for incorporation into a dwelling. In determining whether a product is a consumer product, doubtful cases shall be resolved in

favor of coverage. For a particular product received by a particular user, "normally used" refers to a typical or common use of that class of product, regardless of the status of the particular user or of the way in which the particular user actually uses, or expects or is expected to use, the product. A product is a consumer product regardless of whether the product has substantial commercial, industrial or non-consumer uses, unless such uses represent the only significant mode of use of the product.

"Installation Information" for a User Product means any methods, procedures, authorization keys, or other information required to install and execute modified versions of a covered work in that User Product from a modified version of its Corresponding Source. The information must suffice to ensure that the continued functioning of the modified object code is in no case prevented or interfered with solely because modification has been made. If you convey an object code work under this section in, or with, or specifically for use in, a User Product, and the conveying occurs as part of a transaction in which the right of possession and use of the User Product is transferred to the recipient in perpetuity or for a fixed term (regardless of how the transaction is characterized), the Corresponding Source conveyed under this section must be accompanied by the Installation Information. But this requirement does not apply if neither you nor any third party retains the ability to install modified object code on the User Product (for example, the work has been installed in ROM).

The requirement to provide Installation Information does not include a requirement to continue to provide support service, warranty, or updates for a work that has been modified or installed by the recipient, or for the User Product in which it has been modified or installed. Access to a network may be denied when the modification itself materially and adversely affects the operation of the network or violates the rules and protocols for communication across the network. Corresponding Source conveyed, and Installation Information provided, in accord with this section must be in a format that is publicly documented (and with an implementation available to the public in source code form), and must require no special password or key for unpacking, reading or copying.

## 7. Additional Terms.

"Additional permissions" are terms that supplement the terms of this License by making exceptions from one or more of its conditions. Additional permissions that are applicable to the entire Program shall be treated as though they were included in this License, to the extent that they are valid under applicable law. If additional permissions apply only to part of the Program, that part may be used separately under those permissions, but the entire Program remains governed by this License without regard to the additional permissions. When you convey a copy of a covered work, you may at your option remove any additional permissions from that copy, or from any part of it. (Additional permissions may be written to require their own removal in certain cases when you modify the work.) You may place additional permissions on material, added by you to a covered work, for which you have or can give appropriate copyright permission. Notwithstanding any other provision of this License, for material you add to a covered work, you may (if authorized by the copyright holders of that material) supplement the terms of this License with terms:

- a) Disclaiming warranty or limiting liability differently from the terms of sections 15 and 16 of this License; or
- b) Requiring preservation of specified reasonable legal notices or author attributions in that material or in the Appropriate Legal Notices displayed by works containing it; or

- c) Prohibiting misrepresentation of the origin of that material, or requiring that modified versions of such material be marked in reasonable ways as different from the original version; or
- d) Limiting the use for publicity purposes of names of licensors or authors of the material; or
- e) Declining to grant rights under trademark law for use of some trade names, trademarks, or service marks; or
- f) Requiring indemnification of licensors and authors of that material by anyone who conveys the material (or modified versions of it) with contractual assumptions of liability to the recipient, for any liability that these contractual assumptions directly impose on those licensors and authors. All other non-permissive additional terms are considered "further restrictions" within the meaning of section 10. If the Program as you received it, or any part of it, contains a notice stating that it is governed by this License along with a term that is a further restriction, you may remove that term. If a license document contains a further restriction but permits relicensing or conveying under this License, you may add to a covered work material governed by the terms of that license document, provided that the further restriction does not survive such relicensing or conveying. If you add terms to a covered work in accord with this section, you must place, in the relevant source files, a statement of the additional terms that apply to those files, or a notice indicating where to find the applicable terms. Additional terms, permissive or non-permissive, may be stated in the form of a separately written license, or stated as exceptions; the above requirements apply either way.

## 8. Termination.

You may not propagate or modify a covered work except as expressly provided under this License. Any attempt otherwise to propagate or modify it is void, and will automatically terminate your rights under this License (including any patent licenses granted under the third paragraph of section 11). However, if you cease all violation of this License, then your license from a particular copyright holder is reinstated (a) provisionally, unless and until the copyright holder explicitly and finally terminates your license, and (b) permanently, if the copyright holder fails to notify you of the violation by some reasonable means prior to 60 days after the cessation. Moreover, your license from a particular copyright holder is reinstated permanently if the copyright holder notifies you of the violation by some reasonable means, this is the first time you have received notice of violation of this License (for any work) from that copyright holder, and you cure the violation prior to 30 days after your receipt of the notice. Termination of your rights under this section does not terminate the licenses of parties who have received copies or rights from you under this License. If your rights have been terminated and not permanently reinstated, you do not qualify to receive new licenses for the same material under section 10.

## 9. Acceptance Not Required for Having Copies.

You are not required to accept this License in order to receive or run a copy of the Program. Ancillary propagation of a covered work occurring solely as a consequence of using peer-to-peer transmission to receive a copy likewise does not require acceptance. However, nothing other than this License grants you permission to propagate or modify any covered work. These actions infringe copyright if you do not accept this License. Therefore, by modifying or propagating a covered work, you indicate your acceptance of this License to do so.

## 10. Automatic Licensing of Downstream Recipients.

Each time you convey a covered work, the recipient automatically receives a license from the original licensors, to run, modify and propagate that work, subject to this License. You are not responsible for enforcing compliance by third parties with this License. An "entity transaction" is a transaction transferring control of an organization, or substantially all assets of one, or subdividing an organization, or merging organizations. If propagation of a covered work results from an entity transaction, each party to that transaction who receives a copy of the work also receives whatever licenses to the work the party's predecessor in interest had or could give under the previous paragraph, plus a right to possession of the Corresponding Source of the work from the predecessor in interest, if the predecessor has it or can get it with reasonable efforts. You may not impose any further restrictions on the exercise of the rights granted or affirmed under this License. For example, you may not impose a license fee, royalty, or other charge for exercise of rights granted under this License, and you may not initiate litigation (including a cross-claim or counterclaim in a lawsuit) alleging that any patent claim is infringed by making, using, selling, offering for sale, or importing the Program or any portion of it.

## 11. Patents.

A "contributor" is a copyright holder who authorizes use under this License of the Program or a work on which the Program is based. The work thus licensed is called the contributor's "contributor version". A contributor's "essential patent claims" are all patent claims owned or controlled by the contributor, whether already acquired or hereafter acquired, that would be infringed by some manner, permitted by this License, of making, using, or selling its contributor version, but do not include claims that would be infringed only as a consequence of further modification of the contributor version. For purposes of this definition, "control" includes the right to grant patent sublicenses in a manner consistent with the requirements of this License. Each contributor grants you a non-exclusive, worldwide, royalty-free patent license under the contributor's essential patent claims, to make, use, sell, offer for sale, import and otherwise run, modify and propagate the contents of its contributor version.

In the following three paragraphs, a "patent license" is any express agreement or commitment, however denominated, not to enforce a patent (such as an express permission to practice a patent or covenant not to sue for patent infringement). To "grant" such a patent license to a party means to make such an agreement or commitment not to enforce a patent against the party. If you convey a covered work, knowingly relying on a patent license, and the Corresponding Source of the work is not available for anyone to copy, free of charge and under the terms of this License, through a publicly available network server or other readily accessible means, then you must either (1) cause the Corresponding Source to be so available, or (2) arrange to deprive yourself of the benefit of the patent license for this particular work, or (3) arrange, in a manner consistent with the requirements of this License, to extend the patent license to downstream recipients. "Knowingly relying" means you have actual knowledge that, but for the patent license, your conveying the covered work in a country, or your recipient's use of the covered work in a country, would infringe one or more identifiable patents in that country that you have reason to believe are valid. If, pursuant to or in connection with a single transaction or arrangement, you convey, or propagate by procuring conveyance of, a covered work, and grant a patent license to some of the parties receiving the covered work authorizing them to use, propagate, modify or convey a specific copy of the covered work, then the patent license you grant is automatically extended to all recipients of the

covered work and works based on it. A patent license is "discriminatory" if it does not include within the scope of its coverage, prohibits the exercise of, or is conditioned on the non-exercise of one or more of the rights that are specifically granted under this License. You may not convey a covered work if you are a party to an arrangement with a third party that is in the business of distributing software, under which you make payment to the third party based on the extent of your activity of conveying the work, and under which the third party grants, to any of the parties who would receive the covered work from you, a discriminatory patent license

- (a) in connection with copies of the covered work conveyed by you (or copies made from those copies), or
- (b) primarily for and in connection with specific products or compilations that contain the covered work, unless you entered into that arrangement, or that patent license was granted, prior to 28 March 2007. Nothing in this License shall be construed as excluding or limiting any implied license or other defenses to infringement that may otherwise be available to you under applicable patent law.

## 12. No Surrender of Others' Freedom.

If conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot convey a covered work so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not convey it at all. For example, if you agree to terms that obligate you to collect a royalty for further conveying from those to whom you convey the Program, the only way you could satisfy both those terms and this License would be to refrain entirely from conveying the Program.

## 13. Use with the GNU Affero General Public License.

Notwithstanding any other provision of this License, you have permission to link or combine any covered work with a work licensed under version 3 of the GNU Affero General Public License into a single combined work, and to convey the resulting work. The terms of this License will continue to apply to the part which is the covered work, but the special requirements of the GNU Affero General Public License, section 13, concerning interaction through a network will apply to the combination as such.

## 14. Revised Versions of this License.

The Free Software Foundation may publish revised and/or new versions of the GNU General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Program specifies that a certain numbered version of the GNU General Public License "or any later version" applies to it, you have the option of following the terms and conditions either of that numbered version or of any later version published by the Free Software Foundation. If the Program does not specify a version number of the GNU General Public License, you may choose any version ever published by the Free Software Foundation. If the Program specifies that a proxy can decide which future versions of the GNU General Public License can be used, that proxy's public statement of acceptance of a version permanently authorizes you to choose that version for the Program. Later license versions may give you additional or different permissions. However, no additional obligations are imposed on any author or copyright holder as a result of your choosing to follow a later version.

## 15. Disclaimer of Warranty.

THERE IS NO WARRANTY FOR THE PROGRAM, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE PROGRAM "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE PROGRAM IS WITH YOU. SHOULD THE PROGRAM PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

## 16. Limitation of Liability.

IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MODIFIES AND/OR CONVEYS THE PROGRAM AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PROGRAM (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE PROGRAM TO OPERATE WITH ANY OTHER PROGRAMS), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

## 17. Interpretation of Sections 15 and 16.

If the disclaimer of warranty and limitation of liability provided above cannot be given local legal effect according to their terms, reviewing courts shall apply local law that most closely approximates an absolute waiver of all civil liability in connection with the Program, unless a warranty or assumption of liability accompanies a copy of the Program in return for a fee.

# END OF TERMS AND CONDITIONS

## GNU LESSER GENERAL PUBLIC LICENSE

Version 2.1, February 1999

Copyright (C) 1991, 1999 Free Software Foundation, Inc.  
51 Franklin Street, Fifth Floor, Boston, MA 02110-1301

USA Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed. [This is the first released version of the Lesser GPL. It also counts as the successor of the GNU Library Public License, version 2, hence the version number 2.1.]

## Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public Licenses are intended to guarantee your freedom to share and change free software to make sure the software is free for all its users.

This license, the Lesser General Public License, applies to some specially designated software packages—typically libraries—of the Free Software Foundation and other authors who decide to use it. You can use it too, but we suggest you first think carefully about whether this license or the ordinary General Public License is the better strategy to use in any particular case, based on the explanations below. When we speak of free software, we are referring to freedom of use, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish); that you receive source code or can get it if you want it; that

you can change the software and use pieces of it in new free programs; and that you are informed that you can do these things.

To protect your rights, we need to make restrictions that forbid distributors to deny you these rights or to ask you to surrender these rights. These restrictions translate to certain responsibilities for you if you distribute copies of the library or if you modify it.

For example, if you distribute copies of the library, whether gratis or for a fee, you must give the recipients all the rights that we gave you. You must make sure that they, too, receive or can get the source code. If you link other code with the library, you must provide complete object files to the recipients, so that they can relink them with the library after making changes to the library and recompiling it. And you must show them these terms so they know their rights. We protect your rights with a two-step method: (1) we copyright the library, and (2) we offer you this license, which gives you legal permission to copy, distribute and/or modify the library. To protect each distributor, we want to make it very clear that there is no warranty for the free library. Also, if the library is modified by someone else and passed on, the recipients should know that what they have is not the original version, so that the original author's reputation will not be affected by problems that might be introduced by others.

Finally, software patents pose a constant threat to the existence of any free program. We wish to make sure that a company cannot effectively restrict the users of a free program by obtaining a restrictive license from a patent holder. Therefore, we insist that any patent license obtained for a version of the library must be consistent with the full freedom of use specified in this license. Most GNU software, including some libraries, is covered by the ordinary GNU General Public License. This license, the GNU Lesser General Public License, applies to certain designated libraries, and is quite different from the ordinary General Public License. We use this license for certain libraries in order to permit linking those libraries into non-free programs.

When a program is linked with a library, whether statically or using a shared library, the combination of the two is legally speaking a combined work, a derivative of the original library.

The ordinary General Public License therefore permits such linking only if the entire combination fits its criteria of freedom.

The Lesser General Public License permits more lax criteria for linking other code with the library. We call this license the "Lesser" General Public License because it does less to protect the user's freedom than the ordinary General Public License. It also provides other free software developers Less of an advantage over competing non-free programs. These disadvantages are the reason we use the ordinary General Public License for many libraries.

However, the Lesser license provides advantages in certain special circumstances.

For example, on rare occasions, there may be a special need to encourage the widest possible use of a certain library, so that it becomes a de-facto standard. To achieve this, nonfree programs must be allowed to use the library. A more frequent case is that a free library does the same job as widely used non-free libraries. In this case, there is little to gain by limiting the free library to free software only, so we use the Lesser General Public License.

In other cases, permission to use a particular library in nonfree programs enables a greater number of people to use a large body of free software. For example, permission to use the GNU C Library in non-free programs enables many more people to use the whole GNU operating system, as well as its variant, the GNU/Linux operating system.

Although the Lesser General Public License is Less protective of the users' freedom, it does ensure that the user of a program that is linked with the Library has the freedom and the wherewithal to run that program using a modified version of the Library. The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a "work based on the library" and a "work that uses the library". The former contains code derived from the library, whereas the latter must be combined with the library in order to run.

## TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

0. This License Agreement applies to any software library or other program which contains a notice placed by the copyright holder or other authorized party saying it may be distributed under the terms of this Lesser General Public License (also called "this License"). Each licensee is addressed as "you".

A "library" means a collection of software functions and/or data prepared so as to be conveniently linked with application programs (which use some of those functions and data) to form executables.

The "Library", below, refers to any such software library or work which has been distributed under these terms. A "work based on the Library" means either the Library or any derivative work under copyright law: that is to say, a work containing the Library or a portion of it, either verbatim or with modifications and/or translated straightforwardly into another language. (Hereinafter, translation is included without limitation in the term "modification".) "Source code" for a work means the preferred form of the work for making modifications to it. For a library, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the library.

Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running a program using the Library is not restricted, and output from such a program is covered only if its contents constitute a work based on the Library (independent of the use of the Library in a tool for writing it). Whether that is true depends on what the Library does and what the program that uses the Library does.

1. You may copy and distribute verbatim copies of the Library's complete source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and distribute a copy of this License along with the Library. You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.
2. You may modify your copy or copies of the Library or any portion of it, thus forming a work based on the Library, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:

- a) The modified work must itself be a software library.
- b) You must cause the files modified to carry prominent notices stating that you changed the files and the date of any change.
- c) You must cause the whole of the work to be licensed at no charge to all third parties under the terms of this License.
- d) If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when

the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful. (For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.) These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Library, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Library, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Library. In addition, mere aggregation of another work not based on the Library with the Library (or with a work based on the Library) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may opt to apply the terms of the ordinary GNU General Public License instead of this License to a given copy of the Library. To do this, you must alter all the notices that refer to this License, so that they refer to the ordinary GNU General Public License, version 2, instead of to this License. (If a newer version than version 2 of the ordinary GNU General Public License has appeared, then you can specify that version instead if you wish.) Do not make any other change in these notices. Once this change is made in a given copy, it is irreversible for that copy, so the ordinary GNU General Public License applies to all subsequent copies and derivative works made from that copy. This option is useful when you wish to copy part of the code of the Library into a program that is not a library.
4. You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place, even though third parties are not compelled to copy the source along with the object code.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the



Library (because it contains portions of the Library), rather than a "work that uses the library". The executable is therefore covered by this License. Section 6 states terms for distribution of such executables.

When a "work that uses the Library" uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.) Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

6. As an exception to the Sections above, you may also combine or link a "work that uses the Library" with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer's own use and reverse engineering for debugging such modifications. You must give prominent notice with each copy of the work that the Library is used in it and that the Library and its use are covered by this License. You must supply a copy of this License. If the work during execution displays copyright notices, you must include the copyright notice for the Library among them, as well as a reference directing the user to the copy of this License. Also, you must do one of these things:

- a) Accompany the work with the complete corresponding machine-readable source code for the Library including whatever changes were used in the work (which must be distributed under Sections 1 and 2 above); and, if the work is an executable linked with the Library, with the complete machine readable "work that uses the Library", as object code and/or source code, so that the user can modify the Library and then relink to produce a modified executable containing the modified Library. (It is understood that the user who changes the contents of definitions files in the Library will not necessarily be able to recompile the application to use the modified definitions.)
- b) Use a suitable shared library mechanism for linking with the Library. A suitable mechanism is one that (1) uses at run time a copy of the library already present on the user's computer system, rather than copying library functions into the executable, and (2) will operate properly with a modified version of the library, if the user installs one, as long as the modified version is interface-compatible with the version that the work was made with.
- c) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.
- d) If distribution of the work is made by offering equivalent to copy from a designated place, offer equivalent access to copy the above specified materials from the same place.

e) Verify that the user has already received a copy of these materials or that you have already sent this user a copy. For an executable, the required form of the "work that uses the Library" must include any data and utility programs needed for reproducing the executable from it. However, as a special exception, the materials to be distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable. It may happen that this requirement contradicts the license restrictions of other proprietary libraries that do not normally accompany the operating system. Such a contradiction means you cannot use both them and the Library together in an executable that you distribute.

7. You may place library facilities that are a work based on the Library side-by-side in a single library together with other library facilities not covered by this License, and distribute such a combined library, provided that the separate distribution of the work based on the Library and of the other library facilities is otherwise permitted, and provided that you do these two things:
  - a) Accompany the combined library with a copy of the same work based on the Library, uncombined with any other library facilities. This must be distributed under the terms of the Sections above.
  - b) Give prominent notice with the combined library of the fact that part of it is a work based on the Library, and explaining where to find the accompanying uncombined form of the same work.
8. You may not copy, modify, sublicense, link with, or distribute the Library except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense, link with, or distribute the Library is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.
9. You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Library or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Library (or any work based on the Library), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Library or works based on it.
10. Each time you redistribute the Library (or any work based on the Library), the recipient automatically receives a license from the original licensor to copy, distribute, link with or modify the Library subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties with this License.
11. If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Library at all. For example, if a patent license would not permit royalty free redistribution of the Library by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Library.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply, and the section as a whole is intended to apply in other circumstances.

It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that system; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice. This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

12. If the distribution and/or use of the Library is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Library under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.
13. The Free Software Foundation may publish revised and/or new versions of the Lesser General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns. Each version is given a distinguishing version number. If the Library specifies a version number of this License which applies to it and "any later version", you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Library does not specify a license version number, you may choose any version ever published by the Free Software Foundation.
14. If you wish to incorporate parts of the Library into other free programs whose distribution conditions are incompatible with these, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

## NO WARRANTY

15. BECAUSE THE LIBRARY IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE LIBRARY, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE LIBRARY "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE LIBRARY IS WITH YOU. SHOULD THE LIBRARY PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.
16. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE LIBRARY AS PERMITTED ABOVE, BE LIABLE TO YOU FOR

DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE LIBRARY (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE LIBRARY TO OPERATE WITH ANY OTHER SOFTWARE), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

## END OF TERMS AND CONDITIONS

### How to Apply These Terms to Your New Libraries

If you develop a new library, and you want it to be of the greatest possible use to the public, we recommend making it free software that everyone can redistribute and change. You can do so by permitting redistribution under these terms (or, alternatively, under the terms of the ordinary General Public License).

To apply these terms, attach the following notices to the library: It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty; and each file should have at least the "copyright" line and a pointer to where the full notice is found. one line to give the library's name and an idea of what it does.

Copyright (C) year name of author

This library is free software; you can redistribute it and/or modify it under the terms of the GNU Lesser General Public License as published by the Free Software Foundation; either version 2.1 of the License, or (at your option) any later version.

This library is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU Lesser General Public License for more details.

You should have received a copy of the GNU Lesser General Public License along with this library; if not, write to the Free Software Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA Also add information on how to contact you by electronic and paper mail. You should also get your employer (if you work as a programmer) or your school, if any, to sign a "copyright disclaimer" for the library, if necessary. Here is a sample; alter the names: Yoyodyne, Inc., hereby disclaims all copyright interest in the library 'Frob' (a library for tweaking knobs) written by James Random Hacker. signature of Ty Coon, 1 April 1990 Ty Coon, President of Vice.

### Copyright (c) 1998-2000 University College London

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, is permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. All advertising materials mentioning features or use of this software must display the following acknowledgement: This product includes software developed by the

4. Neither the name of the University nor of the Department may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE AUTHORS AND CONTRIBUTORS "AS IS" AND ANY EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHORS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

### Copyright (c) 2004, Jan Kneschke, incremental

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- Neither the name of the 'incremental' nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

### Copyright (c) 2004, Kneschke, incremental

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.

- Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

- Neither the name of the 'incremental' nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

### Copyright (c) 2005-2010, Thomas BERNARD

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- \* Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- \* Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- \* The name of the author may not be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

### The MIT License

Copyright (c) 1996 by Internet Software Consortium

Copyright (c) 2005-2010 Sam Stephenson

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense,

and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

## libxml2 License

Except where otherwise noted in the source code (e.g. the files hash.c, list.c and the trio files, which are covered by a similar licence but with different Copyright notices) all the files are:

Copyright (C) 1998-2003 Daniel Veillard. All Rights Reserved.

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE DANIEL VEILLARD BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

Except as contained in this notice, the name of Daniel Veillard shall not be used in advertising or otherwise to promote the sale, use or other dealings in this Software without prior written authorization from him.

## OpenSSL LICENSE

Copyright (c) 1998-2006 The OpenSSL Project. All rights reserved. Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. All advertising materials mentioning features or use of this software must display the following acknowledgment: "This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. (<http://www.openssl.org/>)"
4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to endorse or promote products derived

from this software without prior written permission.

For written permission, please contact [openssl-core@openssl.org](mailto:openssl-core@openssl.org).

5. Products derived from this software may not be called "OpenSSL" nor may "OpenSSL" appear in their names without prior written permission of the OpenSSL Project.
6. Redistributions of any form whatsoever must retain the following acknowledgment: "This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (<http://www.openssl.org/>)"

THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE. This product includes cryptographic software written by Eric Young ([ey@cryptosoft.com](mailto:ey@cryptosoft.com)). This product includes software written by Tim Hudson ([tjh@cryptosoft.com](mailto:tjh@cryptosoft.com)).

## Original SSLEAY License

Copyright (C) 1995-1998 Eric Young ([ey@cryptosoft.com](mailto:ey@cryptosoft.com))

All rights reserved. This package is an SSL implementation written by Eric Young ([ey@cryptosoft.com](mailto:ey@cryptosoft.com)). The implementation was written so as to conform with Netscapes SSL. This library is free for commercial and non-commercial use as long as the following conditions are adhered to. The following conditions apply to all code found in this distribution, be it the RC4, RSA, lhash, DES, etc., code; not just the SSL code. The SSL documentation included with this distribution is covered by the same copyright terms except that the holder is Tim Hudson ([tjh@cryptosoft.com](mailto:tjh@cryptosoft.com)). Copyright remains Eric Young's, and as such any Copyright notices in the code are not to be removed. If this package is used in a product, Eric Young should be given attribution as the author of the parts of the library used. This can be in the form of a textual message at program startup or in documentation (online or textual) provided with the package. Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. All advertising materials mentioning features or use of this software must display the following acknowledgment: "This product includes cryptographic software written by Eric Young ([ey@cryptosoft.com](mailto:ey@cryptosoft.com))" The word "cryptographic" can be left out if the routines from the library being used are not cryptographic related :-).
4. If you include any Windows specific code (or a derivative thereof) from the apps directory (application code) you must include an acknowledgment: "This product includes software written by Tim Hudson ([tjh@cryptosoft.com](mailto:tjh@cryptosoft.com))"

THIS SOFTWARE IS PROVIDED BY ERIC YOUNG "AS IS AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS;

OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

The licence and distribution terms for any publically available version or derivative of this code cannot be changed. i.e. this code cannot simply be copied and put under another distribution licence [including the GNU Public Licence.]

## PHP License

---

The PHP License, version 3.01

Copyright (c) 1999 - 2012 The PHP Group. All rights reserved.

---

Redistribution and use in source and binary forms, with or without modification, is permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. The name "PHP" must not be used to endorse or promote products derived from this software without prior written permission. For written permission, please contact [group@php.net](mailto:group@php.net).
4. Products derived from this software may not be called "PHP", nor may "PHP" appear in their name, without prior written permission from [group@php.net](mailto:group@php.net). You may indicate that your software works in conjunction with PHP by saying "Foo for PHP" instead of calling it "PHP Foo" or "phpfoo"
5. The PHP Group may publish revised and/or new versions of the license from time to time. Each version will be given a distinguishing version number.  
Once covered code has been published under a particular version of the license, you may always continue to use it under the terms of that version. You may also choose to use such covered code under the terms of any subsequent version of the license published by the PHP Group. No one other than the PHP Group has the right to modify the terms applicable to covered code created under this License.

6. Redistributions of any form whatsoever must retain the following acknowledgment:

"This product includes PHP software, freely available from <http://www.php.net/software/>".

THIS SOFTWARE IS PROVIDED BY THE PHP DEVELOPMENT TEAM "AS IS" AND ANY EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE PHP DEVELOPMENT TEAM OR ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

---

This software consists of voluntary contributions made by many individuals on behalf of the PHP Group.

The PHP Group can be contacted via Email at [group@php.net](mailto:group@php.net).

For more information on the PHP Group and the PHP project, please see <http://www.php.net>. PHP includes the Zend Engine, freely available at <http://www.zend.com>.



This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.



Samsung Techwin cares for the environment at all product manufacturing stages, and is taking measures to provide customers with more environmentally friendly products. The Eco mark represents Samsung Techwin's devotion to creating environmentally friendly products, and indicates that the product satisfies the EU RoHS Directive.



#### **Correct Disposal of This Product (Waste Electrical & Electronic Equipment)**

(Applicable in the European Union and other European countries with separate collection systems)

This marking on the product, accessories or literature indicates that the product and its electronic accessories (e.g. charger, headset, USB cable) should not be disposed of with other household waste at the end of their working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate these items from other types of waste and recycle them responsibly to promote the sustainable reuse of material resources.

Household users should contact either the retailer where they purchased this product, or their local government office, for details of where and how they can take these items for environmentally safe recycling.

Business users should contact their supplier and check the terms and conditions of the purchase contract. This product and its electronic accessories should not be mixed with other commercial wastes for disposal.



#### **Correct disposal of batteries in this product**

(Applicable in the European Union and other European countries with separate battery return systems.)

This marking on the battery, manual or packaging indicates that the batteries in this product should not be disposed of with other household waste at the end of their working life. Where marked, the chemical symbols Hg, Cd or Pb indicate that the battery contains mercury, cadmium or lead above the reference levels in EC Directive 2006/66. If batteries are not properly disposed of, these substances can cause harm to human health or the environment.

To protect natural resources and to promote material reuse, please separate batteries from other types of waste and recycle them through your local, free battery return system.

# MEMO



## **SALES NETWORK**

---

### **SAMSUNG TECHWIN CO., LTD.**

6, Pangyo-ro 319beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, SEOUL 463-400 Rep. of KOREA

Tel : +82-70-7147-8753, 8764 Fax : +82-31-8018-3740

[www.samsungsecurity.com](http://www.samsungsecurity.com)

### **SAMSUNG TECHWIN AMERICA Inc.**

100 Challenger Rd. Suite 700 Ridgefield Park, NJ 07660

Toll Free : +1-877-213-1222 Direct : +1-201-325-6920

Fax : +1-201-373-0124

[www.samsung-security.com](http://www.samsung-security.com)

### **SAMSUNG TECHWIN EUROPE LTD.**

2nd Floor, No. 5 The Heights, Brooklands, Weybridge,  
Surrey, KT13 0NY, UK

Tel : +44-1932-82-6700 Fax : +44-1932-82-6701

[www.samsungsecurity.co.uk](http://www.samsungsecurity.co.uk)

---

[www.samsungtechwin.com](http://www.samsungtechwin.com)

[www.samsungsecurity.com](http://www.samsungsecurity.com)

[www.samsungipolis.com](http://www.samsungipolis.com)